LETTER OF TRANSMITTAL

Parkson
Treating Water Right

Transmittal Date: 6/16/2022

Project Name:Jefferson, GA		**Job #**		**Parkson**		
		PO#	**0000000488**	Project #	P01501867	
Customer/Contractor: House of Raedford Inc.-Arcadia, LA				Description	DSF,50FT2,(10)DBTF,Mod	
Address: 147 Athens Street, Jefferson, GA				Spec Section	46 61 00	
				Engineer	Francisco Camargo	
				Email	FCamargo@parkson.com	
				Project #		
Attn:	Priscilla Murphy	**e-mail**	pmurphy@cityofjeffersonga.com	Description		
Phone:	**Fax:**			Spec Section		
Engineer Address:				Engineer		
				Email		
				Project #		
				Description		
				Spec Section		
				Engineer		
Attn:		**e-mail**		Email		
Phone:	**Fax:**					

We are transmitting the following:

	No. Copies	Approval	Your Use	Review & Comment	As Requested
Submittal Package	**1 (Electronic)**	**X**		**X**	
Re-Submittal					
Certified Drawings					
IOM Manuals					
Other:					

REMARKS/COMMENTS

RETURN (1) COPY of this TRANSMITTAL TO:

Project Manager: **Jorge Fernandez**
JFernandez@parkson.com

Parkson Address: **Parkson Corporation**
1401 W Cypress Creek Rd, Suite 100
Fort Lauderdale, FL 33309-1721
(954) 974-6610

APPROVAL REQUIRED NO LATER THAN:

Estimated Shipping date _____ **weeks After Drawing Approval (ADA)**

PLEASE NOTE: Although every attempt will be made to ship within our quoted lead times, our estimated ship date. is subject to final approval and fabricator workload at the time final approval is received by Parkson. Commencement of performance, including this submittal transmission, shall not constitute acceptance of the order. Only a signed contract, containing mutually agreeable terms and conditions, shall act as an acceptance.

DISTRIBUTION

	Contractor	Clint Curl The TDH Company 3225	**Rep**		**File**
	Engineer				**Service**

Rev Date 7/16/2014.
CC: Project Manager

PROJECT NAME:

JEFFERSON
GA

ATTENTION:

Priscilla Murphy

SUBMITTAL DATE:

June 16, 2022

PROJECT NUMBER:

P01501867

PRODUCT:

(10) DYNASAND® CONTINUOUS BACKWASH SAND FILTER

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1004649	Rev. 4	Sand, Washer, Assy. DSF,50FT2, BOM
1004649	Rev. A	Sand, Washer, Assy. DSF,50FT2
1001019	Rev. 2	Gauge, Headloss, 48, DB, BOM
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Section I – DYNASAND FILTER

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P0150186701	**Rev. 0 (sheet 6 of 6)**	**DSF-50FT2, DBTF, (10) Modules General Arrangement, Details**
P0150186705	**Rev. 0**	**DSF-50FT2, DBTF, (10) Modules, , Grating Arrangement**

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1025121	Rev. 2	Cone, 50Ft2, No Drain BOM
1025121	Rev. B	Cone, 50Ft2, No Drain Assembly
1010395-01	Rev. 3	Feed Assembly,50, 2pc, DBTF
1010395-01	Rev. A	Feed Assembly,50, 2pc, DBTF
1003791-01	Rev. 8	Pump, Airlift, 38&50, DBTF BOM
1003791-01	Rev. C	Pump, Airlift, 38&50, DBTF Assy.
1004649	Rev. 4	Sand, Washer, Assy. DSF,50FT2, BOM
1004649	Rev. A	Sand, Washer, Assy. DSF,50FT2
1001019	Rev. 2	Gauge, Headloss, 48, SB, BOM
1001019	Rev. 0	Gauge, Headloss, 48, SB
1001201	Rev. 4	Low Level Switch Assembly & BOM
1001201-01	Rev. A	Low Level Switch Assembly
	--------	Level switch Cut sheet

Single Level EBOM

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186709**	**Spare,Parts,DSF,FT2**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing		
BOM Quantity	**1**	**ea**

Date 06/15/22 (14:15:37)

Item no.	Component / Description	Item Rev.	Drawing	Size	Material	Item Type	Length []	Width []	No. of Units	Net Quantity	Unit
10	0003304 O-Ring,#2-147,2.675 IDx3/32Thk Buna-N, Parker Or Equal	0		2.675 x 3/32	Buna-N	P				2.0000	ea
20	1003387 Screen,Inlet,45mm,316L For PVC Pumps Only	C	1003387-.DWG	1 1/2	316L	M				1.0000	ea
30	0000191 Flowmeter,20-200 SCFH,Dwyer #VFB55SSV,Polycarbonate	0			Polycarb	P				1.0000	ea
40	0007527 Regulator,Air,Parker,0-60 psi 3/8" FNPT Model # 06R211AC	0		3/8" NPT		P				1.0000	ea
50	0960234 Filter,Air,Parker,1/4" NPT Parker,Model # 06F14BC With Metal Bowl	0				P				1.0000	ea

Single Level EBOM

Date 06/16/22 (10:02:06)

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Item no.	Component / Description	Item Rev.	Drawing	Size	Material	Item Type	Length []	Width []	No. of Units	Net Quantity	Unit
80	0000523 Coupling,Flex,3 Stdx3 Std Fernco 1056-33,PVC	0		3 Stdx3 Std	PVC	P				15.0000	ea
90	1025121 Cone,50Ft2,No,Drain,304	2	1025121B.dwg	50FT2	FRP/304	M				10.0000	ea
190	1003371 Rod,Threaded,3/4-10x8	0		3/4-10x8	304	M				10.0000	ea
200	0001451 Anchor,Drop-In,3/4-10	0		3/4	304	P				10.0000	ea
210	1010437 Washer,Flat,4,13/16,11GA 4 OD x 13/16 ID SEE 1010438 BALANCE BEFORE ORDERING SUBSTITUTE IF AVAILABLE 304SS	0	018486-01.dwg	4 ODx13/16ID	304	M				20.0000	ea
230	0000667 Nut,Hex,3/4-10,304	0		3/4-10	304	P				22.0000	ea
240	0001456 Anchor,Wedge,3/8-16x5,304	0		3/8x5	304	P				130.0000	ea
250	0001491 Bolt,Hex,FullThrd,3/8-16x3 1/2	0		3/8-16x3 1/2	304	P				22.0000	ea
260	0000917 Washer,Fender,3/8	0		3/8	304	P				170.0000	ea
270	0000758 Washer,Lock,3/8	0		3/8	304	P				22.0000	ea
280	0000891 Nut,Hex,3/8-16,304	0		3/8-16	304	P				22.0000	ea

Single Level EBOM

Project	**P01501867**	**Jefferson, GA - DSF**	
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**	
Engineering Item Revision	**0**	**Initial Release**	
Revision Status	**In-design**		
Drawing	**P0150186701.dwg**		
BOM Quantity	**1**	**ea**	

290	1010395	6	1010395C.dwg	50 Mod,DBTF	304L	M	10.0000	ea
	Feed Assembly,50,2pc,DBTF							
300	1003791	12	1003791C.DWG	38&50,1Pc	PVC	M	10.0000	ea
	Pump,Airlift,38&50,DBTF,PVC							
	For 4" S.S. housing only							
310	1003467	2	1003467A.dwg	4x4x1/4x22	304	M	20.0000	ea
	Angle,Supp,Frame,Reject,22,304							
320	0001459	0		3/4x5 1/2	304	P	22.0000	ea
	Anchor,Wedge,3/4-10x5 1/2							
330	1003465	1	1003465A.dwg	7'	Alum	M	10.0000	ea
	Frame,Reject Supp,13 1/4"							
	(1) 50Ft2,Module,Parallel,Alum.							
340	0000958	0		5/8-11x2	304	P	43.0000	ea
	Bolt,Hex,5/8-11x2,304							
350	0000894	0		5/8-11	304	P	43.0000	ea
	Nut,Hex,5/8-11,304							
360	0001653	0		5/8	304	P	43.0000	ea
	Washer,Bevel,5/8,304							
370	0001161	0		5/8	304	P	43.0000	ea
	Washer,Flat,5/8,304							
380	0000762	0		5/8	304	P	43.0000	ea
	Washer,Lock,5/8,304							
390	1004649	4	1004649A.dwg	50 Mod	FRP/316L	M	10.0000	ea
	Sand,Washer,Assy,DSF-50 Mod							
	Sand Washer Assembly for DSF-50 Module							
400	0000954	0		1/2-13x2	304	P	43.0000	ea
	Bolt,Hex,1/2-13x2,304							
410	0000445	0		1/2-13	304	P	43.0000	ea
	Nut,Hex,1/2-13,304							

Single Level EBOM

Date 06/16/22 (10:02:06)

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length []	Width []	No. of Units	Net Quantity	Unit
420	0001158 Washer,Flat,1/2,304	0		1/2	304	P				43.0000	ea
430	0000450 Washer,Lock,1/2,304	0		1/2	304	P				43.0000	ea
440	0001651 Washer,Bevel,1/2,304	0		1/2	304	P				43.0000	ea
450	1010265 Manifold,Feed,10,1 Row,2 Mod,L Left Hand Feed,HDPE	1	014103-01.dwg	10,SDR 32.5	HDPE	M				5.0000	ea
460	0000529 Coupling,Flex,8 Stdx8 Std Fernco 1056-88,PVC	0		8 Stdx8 Std	PVC	P				10.0000	ea
470	0003018 Coupling,Flex,10 Stdx10 Std FERNCO # 1056-1010	0		10Std x10Std	PVC	P				5.0000	ea
480	1003142 Clamp,10,IPS,304	1	F00061a.dwg		304	M				10.0000	ea
490	1001198 Rod,Threaded,1/2-13x22	0		1/2	304	M				20.0000	ea
500	0001158 Washer,Flat,1/2,304	0		1/2	304	P				65.0000	ea
510	0001651 Washer,Bevel,1/2,304	0		1/2	304	P				22.0000	ea
520	0000450 Washer,Lock,1/2,304	0		1/2	304	P				85.0000	ea
530	0000445	0		1/2-13	304	P				85.0000	ea

Single Level EBOM

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Date 06/16/22 (10:02:06)

Nut,Hex,1/2-13,304

540	1010569 Tray,Airline,10',FRP	1		10'	FRP	M	5.0000	ea
550	0001491 Bolt,Hex,FullThrd,3/8-16x3 1/2	0		3/8-16x3 1/2	304	P	12.0000	ea
560	0001499 Washer,Bevel,3/8,304	0		3/8	304	P	12.0000	ea
570	0001156 Washer,Flat,3/8	0		3/8	304	P	12.0000	ea
580	0000758 Washer,Lock,3/8	0		3/8	304	P	12.0000	ea
590	0000891 Nut,Hex,3/8-16,304	0		3/8-16	304	P	12.0000	ea
600	P0150186707 Air Control Panel, ACP FRP, DSF50 2-module ACP Reference: Correspondence dated Friday, April 15, 2022	-	P0150186707.dwg		FRP	P	5.0000	ea
670	1001201 Switch Assy,Low Level,316	4	1001201A.dwg		316	M	5.0000	ea
680	1025153 Plate,Name,DSF Model # DSF,50FT2,DBTF Series # P01501867	0	1025153.pdf	15.5x23.5	SS	M	1.0000	ea
690	0000521 Anchor,Wedge,1/4-20x1 3/4,304	0		1/4x1 3/4	304	P	5.0000	ea
700	P0150186705 Grating,Arrangement,Alum	0	P0150186701.dwg			M	1.0000	ea
720	1001019 Gauge,Headloss,48,DB,316	2	1001019.dwg	48	316	M	1.0000	ea

Single Level EBOM

Date 06/16/22 (10:02:06)

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length []	Width []	No. of Units	Net Quantity	Unit
730	0001454 Anchor,Wedge,3/8-16x3 3/4,304	0		3/8x3 3/4	304	P				3.0000	ea
750	0002654 Filter Media,1.4 mm	0		1.4		P				17.8500	ton
770	1010264 Manifold,Reject,1 Row,2 Mod,RH Right Hand,(2) 50Ft2 Modules,3" Sch 80,PVC	1	014087-01.dwg	3 Sch 80	PVC	M				2.0000	ea
800	1001799 Support,Pipe,Reject,304 For 3 & 4 in. Pipe. 6" From the Wall	2	1001799-01.dwg	3&4" Pipe	304	M				10.0000	ea
810	0001454 Anchor,Wedge,3/8-16x3 3/4,304	0		3/8x3 3/4	304	P				22.0000	ea
880	0001436 U-Bolt,3 Pipe,1/2-13,304 Supplied with nuts and washers	0		1/2	304	P				10.0000	ea
890	1001040 Angle,I-Beam Support,304	2	1001040.dwg		304	M				20.0000	ea
900	0001459 Anchor,Wedge,3/4-10x5 1/2	0		3/4x5 1/2	304	P				42.0000	ea
910	0000958 Bolt,Hex,5/8-11x2,304	0		5/8-11x2	304	P				42.0000	ea
920	0000894 Nut,Hex,5/8-11,304	0		5/8-11	304	P				42.0000	ea
930	0001161 Washer,Flat,5/8,304	0		5/8	304	P				42.0000	ea
940	0000762	0		5/8	304	P				42.0000	ea

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Washer,Lock,5/8,304

Item no.	Component / Description	Item Rev.	Drawing	Size	Material	Item Type	Length []	Width []	No. of Units	Net Quantity	Unit
950	0001653 Washer,Bevel,5/8,304	0		5/8	304	P				42.0000	ea
960	1003191 I-Beam,Support,Grating,6061-T6 Alum, I-Beam 8x6.35 American Standard	2	1003191A.dwg	8x4x7'-0"	Alum	M				10.0000	ea
970	1002463 Angle,Grating,Support,Alum 3X3X3/8X7FT,Alum	3	1002463A.dwg	3X3X3/8X7	Alum	M				5.0000	ea
980	0001457 Anchor,Wedge,1/2-13x3 3/4	0		1/2x3 3/4	304	P				75.0000	ea
990	1003358 Angle,Grating,Support,11'8"	0	004002-01.dwg	3x3x3/8x11'8	Alum	M				3.0000	ea
1000	1009204 Angle,Grating,Support,Alum	0	F00776.dwg	3X3X3/8X15	Alum	M				4.0000	ea
1010	P0150186709 Spare,Parts,DSF,FT2	0				M				1.0000	ea
1020	P0150186710 Air,Compressor,Syst.,CW-15-DD The Parkson Compressor System is a complete compressed air system shipped loose for contractor mounting, piping, and wiring. The system is comprised two (2) rotary screw air compressors, each mounted on an 80 gallon tank and one free standing desiccant air dryer with pre & after filtration. Air Compressor: Model(2) UP6-7.5-150	0				P				1.0000	ea

Single Level EBOM

Project	**P01501867**	**Jefferson, GA - DSF**
Engineering Item	**P0150186701**	**DSF,50FT2,DBTF,(10)Mod.304**
Engineering Item Revision	**0**	**Initial Release**
Revision Status	**In-design**	
Drawing	**P0150186701.dwg**	
BOM Quantity	**1**	**ea**

Capacity23.1 CFM (each)
HP7.5 (each)
Rated Pressure150 PSIG
Voltage460/3/60
FLA Draw8.9 Amps (each)
Motor RPM3510
BTU Discharge20,800 Btu/hr (each)
Noise Level65 dBA

Desiccant Air Dryer (s)

Dryer Amp Draw.5
Model NumberDA40IM
Voltage115/1/60
Package Discharge Conn3/4" NPT
Capacity24.0 CFM
Max Pressure200 PSIG

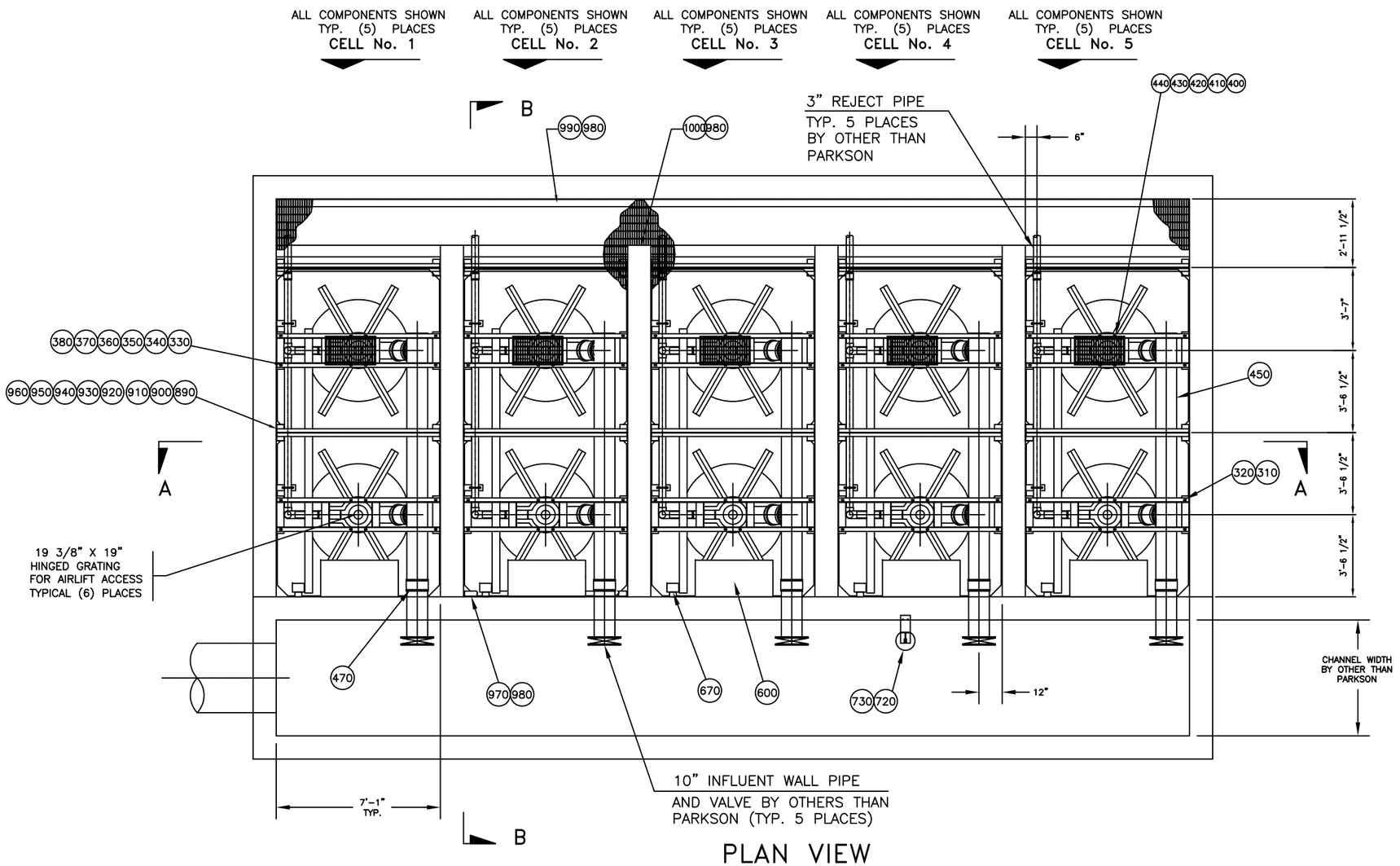
Per quote # ENIPQV-2022271 dated 2/7/2022

NOTES

1. BOTTOM CONE MUST BE LEVELED ACROSS STEEL BRACKETS.
2. WHEN INSTALLING BOTTOM CONE, MAKE SURE THAT DRAIN PIPES ARE FACING AS SHOWN BELOW.
3. FIBERGLASS ITEMS ARE FLAMMABLE, DO NOT BURN OR WELD OVERHEAD.
4. COMPONENTS MUST BE LIFTED BY LIFTING LUGS PROVIDED.
5. FILL SAND ONLY TO THE LEVEL INDICATED ON SECTION A–A FOLLOWING THE OPERATING INSTRUCTIONS.
6. ALL WIRING AND PIPING TO THE PANEL SHALL BE SUPPLIED BY OTHERS AND PUT IN CONDUIT BY CONTRACTOR.

BOTTOM CONES INSTALLATION PROCEDURE–TOPFEED DYNASAND

1. LOCATE ANCHOR BOLTS (3/4"–10 X 8" ROD & DROP–IN ANCHOR) IN THE BASIN. REFER TO DRAWING P0150186701 SHEET 4 FOR DIMENSIONS. ANCHOR BOLT TO PROTRUDE 3 1/2" MIN. ABOVE THE CONCRETE FLOOR. FLOOR TO BE LEVEL WITHIN ± 1/4".
2. LOWER THE BOTTOM CONE INTO THE BASIN AND PLACE THEM AS SHOWN IN THE INSTALLATION INSTRUCTIONS. SECURE THE CONES WITH WASHERS AND NUTS PROVIDED. SEE INSTALLATION INSTRUCTIONS FOR LEVELING THE BOTTOM CONE AND PLACING GROUT UNDER THE CONE BOTTOMS.
3. NOTE: IT IS VERY IMPORTANT THE INTERNAL BRACKETS ARE LEVEL.
4. POUR CONCRETE THROUGHOUT THE BASIN EVENLY FROM THE 6" CORNER OPENINGS. MAKE FIRST POUR TO MAXIMUN DEPTH 18" REMOVE ANY CONCRETE THAT DROPS INSIDE BOTTOM CONES BEFORE IT HARDENS. ALLOW TO CURE.
5. THE SECOND POUR SHOULD FILL TO HALF WAY TO THE TOP OF THE CONES. REMOVE CONCRETE THAT DROPS INSIDE BOTTOM CONES BEFORE IT HARDENS. ALLOW TO CURE.
6. THE THIRD POUR SHOULD FILL THE GAPS BETWEEN THE CONES AS CLOSE TO THE TOPS AS POSSIBLE. ANY GAPS REMAINING WILL HAVE TO BE FILLED AFTERWARD WITH GROUT OR CAULK. REMOVE ANY CONCRETE THAT DROPS INSIDE BOTTOM CONES BEFORE IT HARDENS. ALLOW TO CURE.
9. USE A GROUT OR CAULK TO FILL THE REMAINING GAPS BETWEEN CONES AND BETWEEN WALLS. ALL JOINTS MUST BE FILLED TO THE TOP.



PLAN VIEW

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

__INFORMATION __CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

DRAWN BY	DATE
FJC	6–15–22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson™

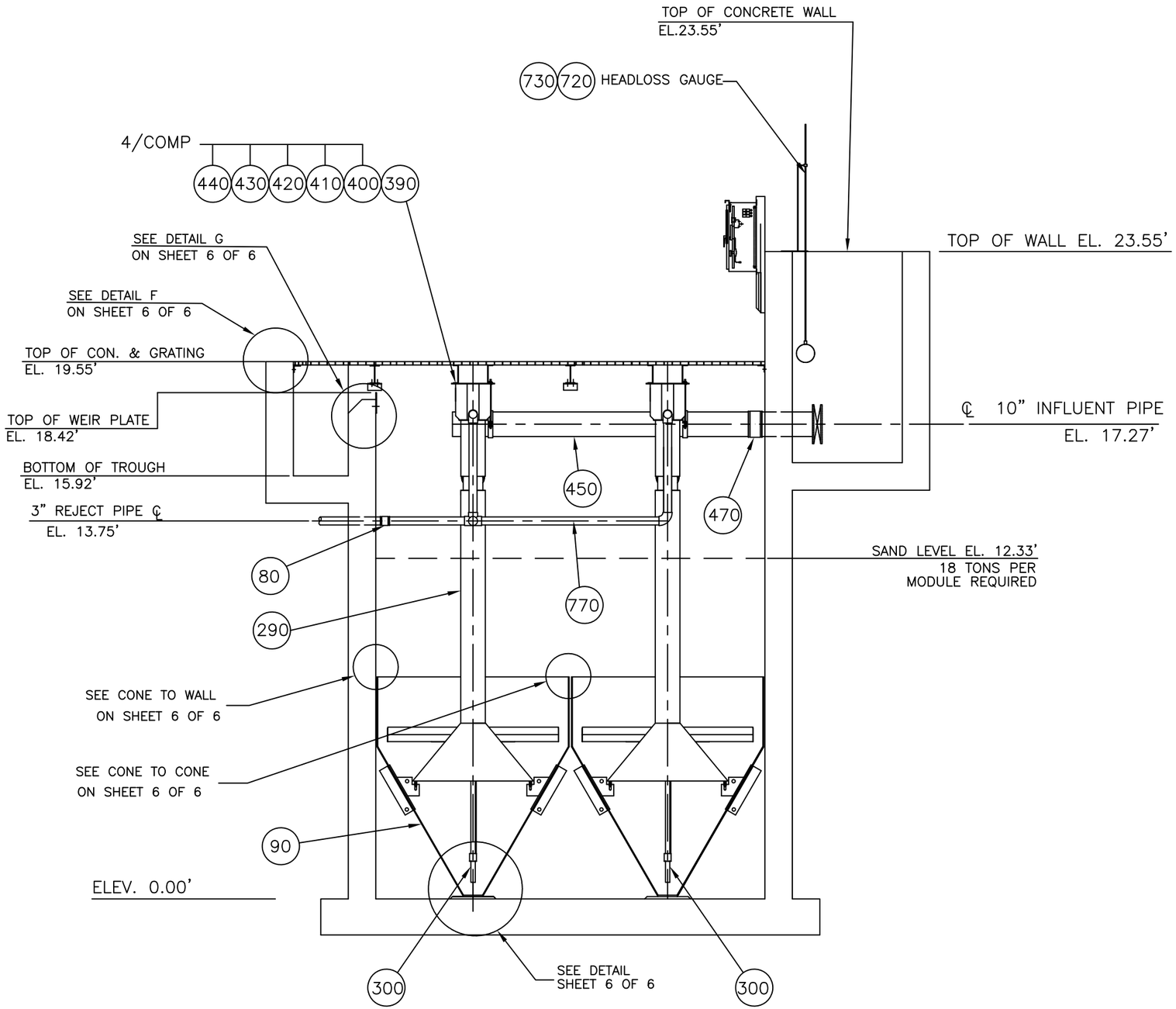
PROJECT NAME
P01501867
JEFFERSON
GA

REFERENCE INFORMATION

TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
GENERAL ARRANGMENT – PLAN VIEW

DRAWING NO
P0150186701
SHEET 1 OF 6

REV
—



SECTION B–B

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

__INFORMATION __CERTIFIED

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DRAWN BY	DATE
FJC	6–14–22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson™

PROJECT NAME
P01501867
JEFFERSON
GA

REFERENCE INFORMATION

TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
GENERAL ARRANGMENT – SECTION A–A

DRAWING NO
P0150186701
SHEET 2 OF 6

REV
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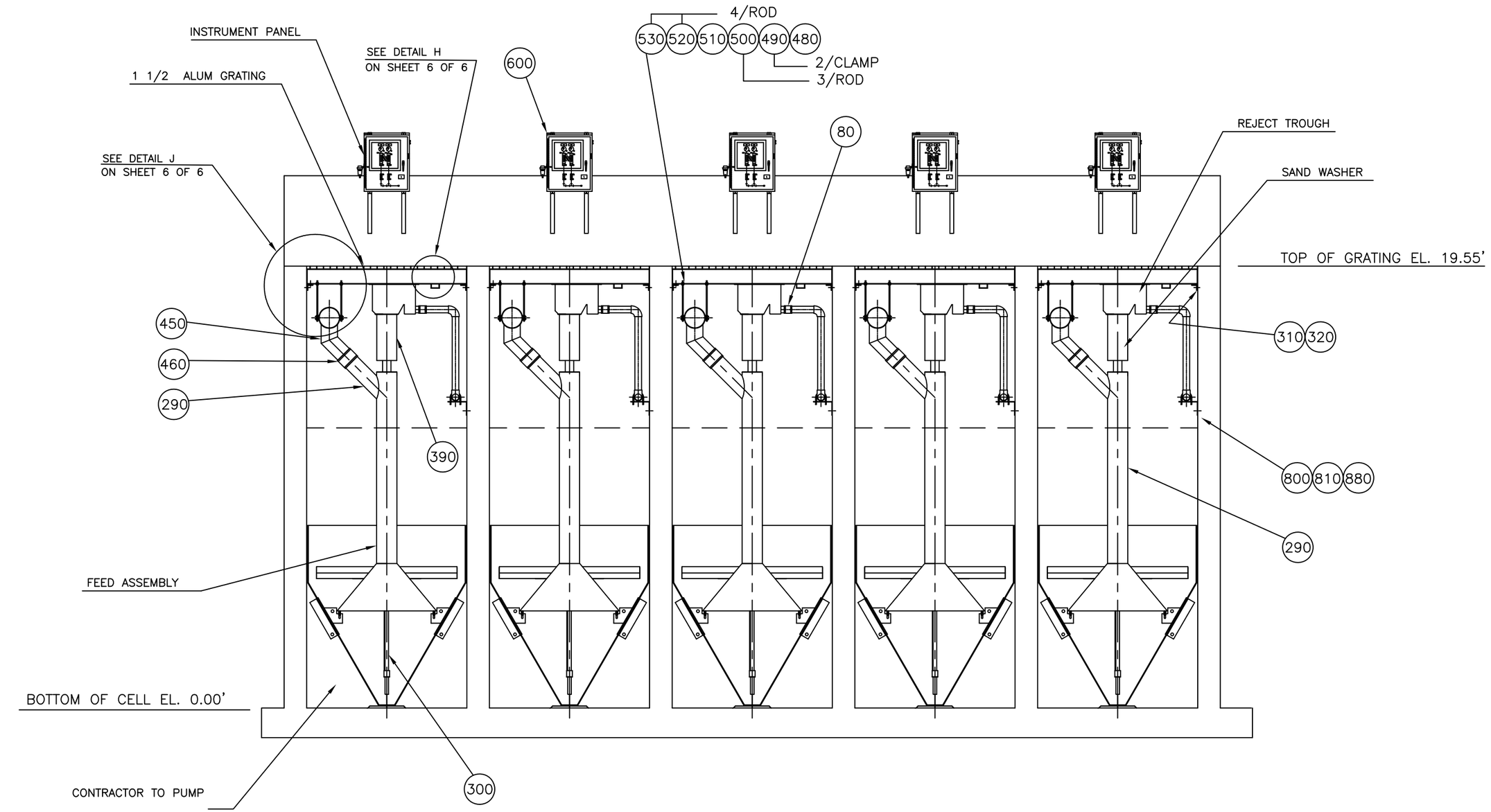

SECTION A–A

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

__INFORMATION __CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

DRAWN BY	DATE
FJC	6-14-22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson™

PROJECT NAME
P01501861
JEFFERSON
GA

REFERENCE INFORMATION

TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
GENERAL ARRANGMENT – SECTION B–B

DRAWING NO
P0150186701
SHEET 3 OF 6

REV
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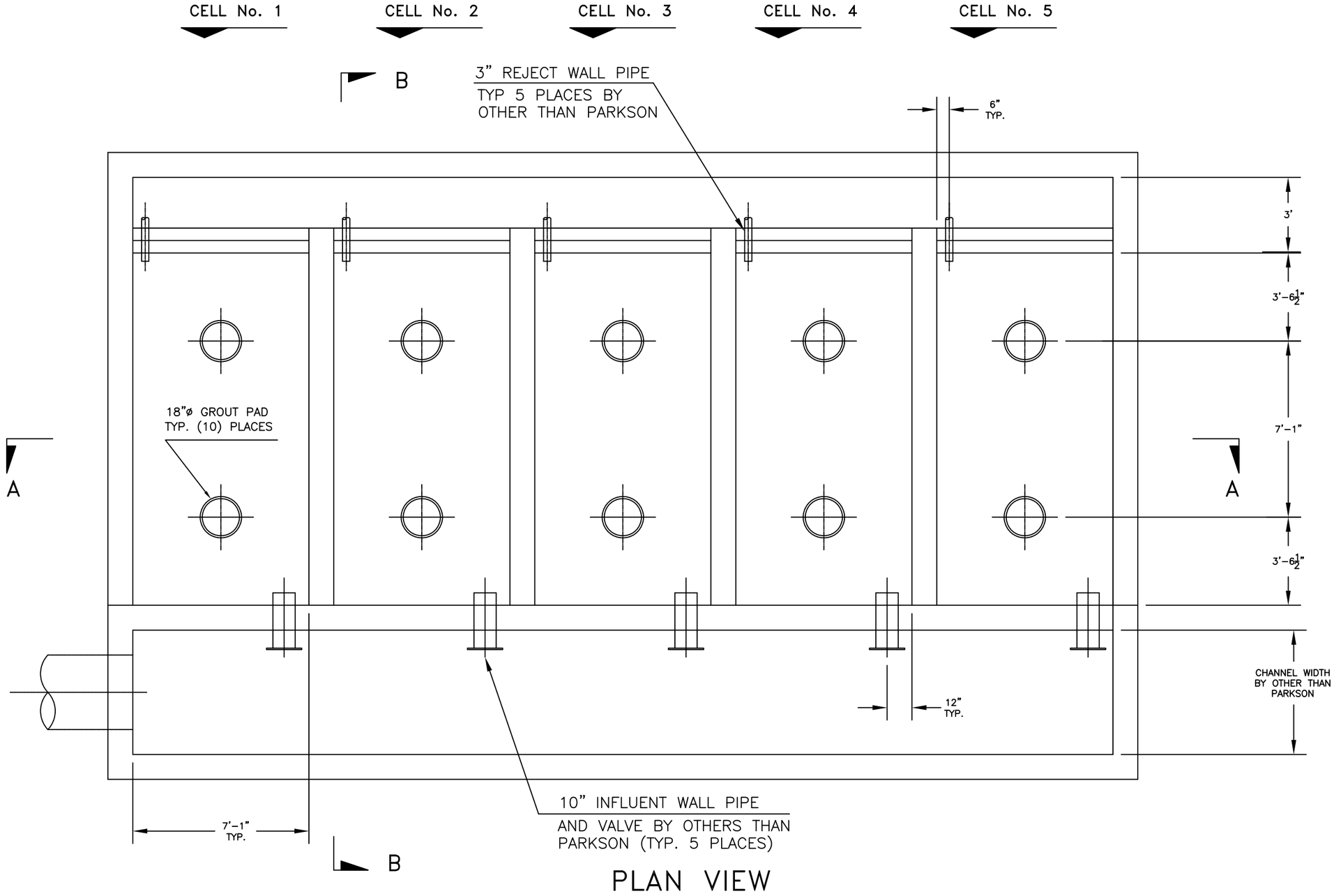

PLAN VIEW

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

__INFORMATION __CERTIFIED

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DRAWN BY	DATE
FJC	6-15-22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson™

PROJECT NAME
P01501867
JEFFERSON
GA

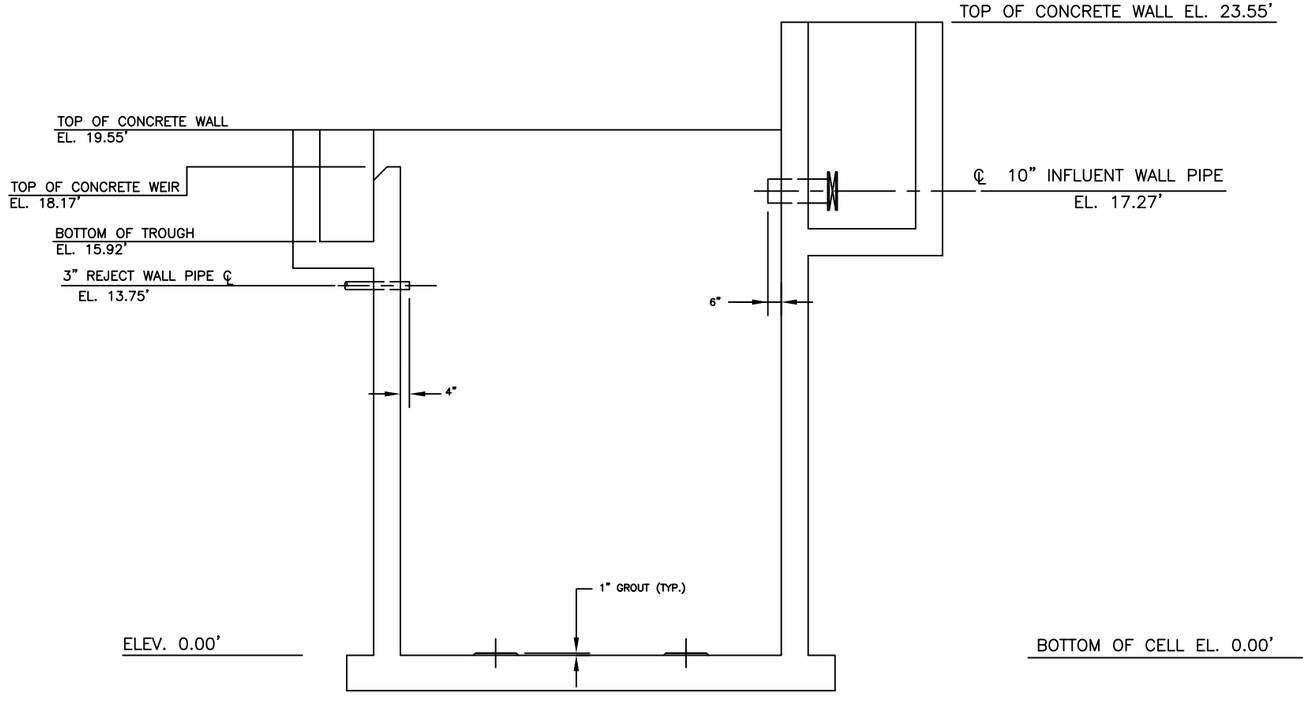
REFERENCE INFORMATION

TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
LOSDING DIAGRAM –PLAN VIEW

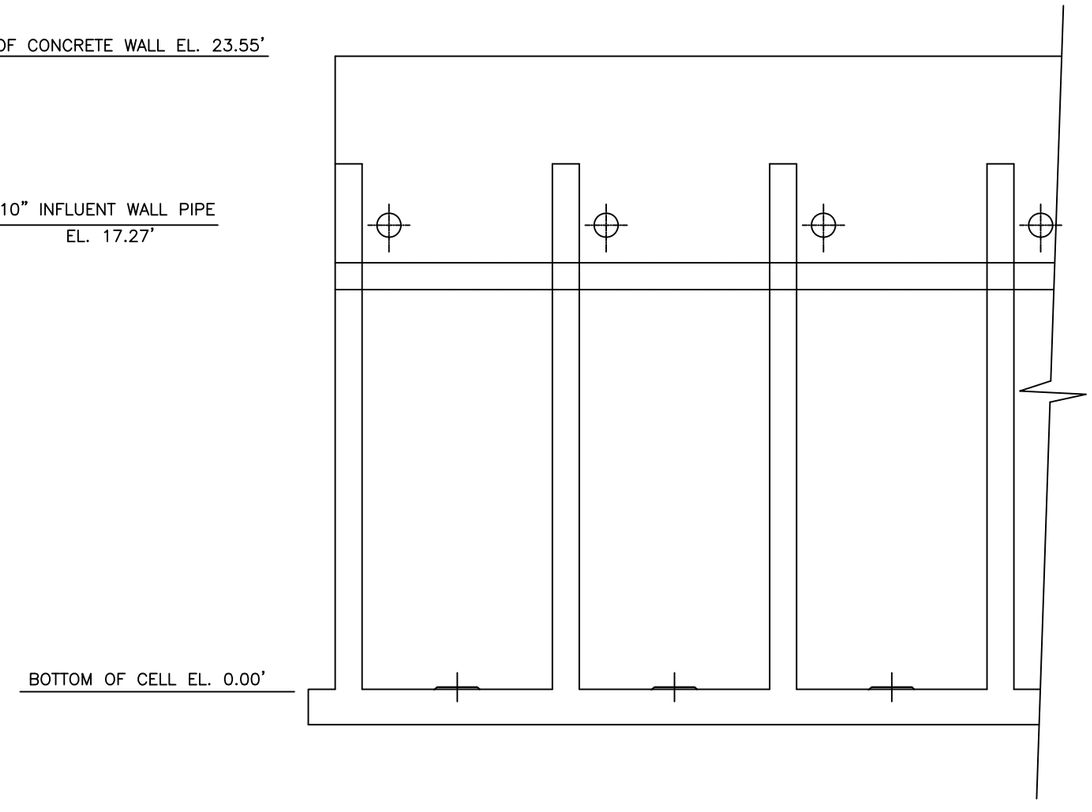
DRAWING NO
P0150186701
SHEET 4 OF 6

REV
—

LOADING CONDITIONS ON CONCRETE FLOOR PER CELL (IMPERIAL)	
72.0	KIPS OF DRY SAND
3.0	KIPS OF FILTER INTERNALS
56.4	KIPS OF WATER
66.0	KIPS OF CONCRETE FILL
TOTAL:197.4 KIPS OR 1974 #/SQ.FT.	



SECTION C–C



SECTION D–D

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

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DRAWN BY	DATE
FJC	6–15–22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson™

PROJECT NAME
P01501867
JEFFERSON
GA

REFERENCE INFORMATION

TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
LOADING DIAGRAM– SECTIONS C–C AND D–D

DRAWING NO
P0150186701
SHEET 5 OF 6

REV
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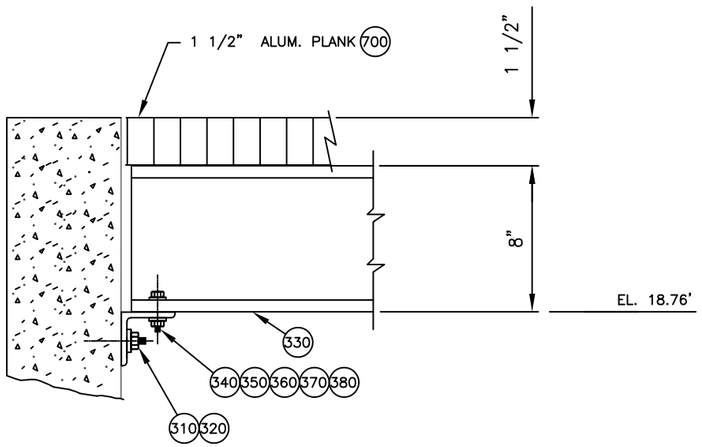
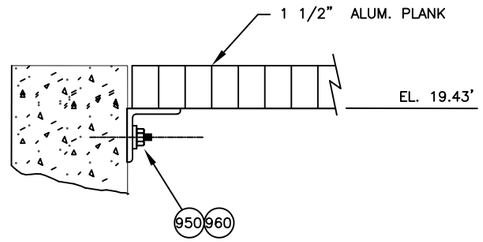
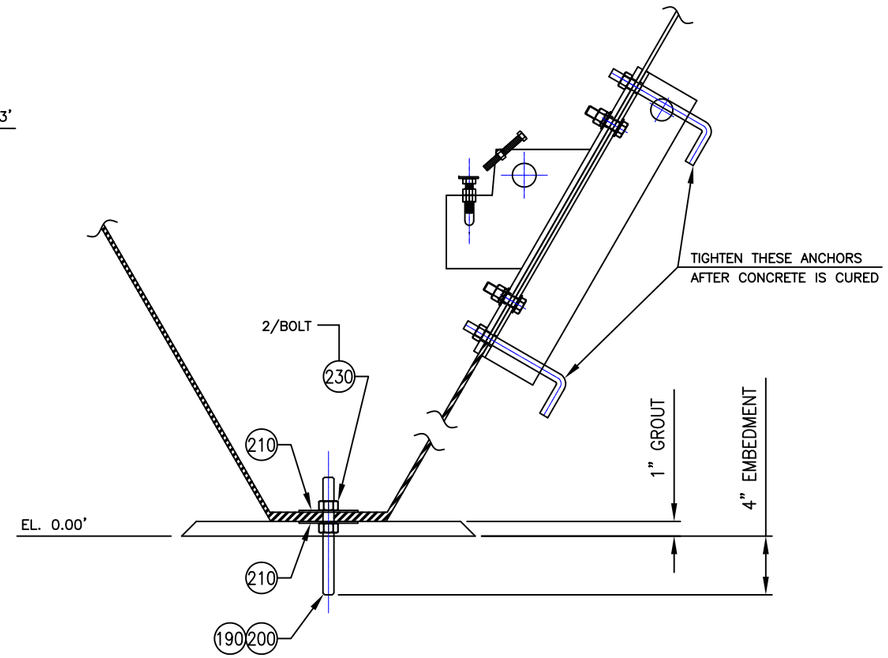


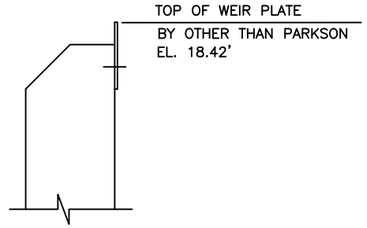
SECTION E–E



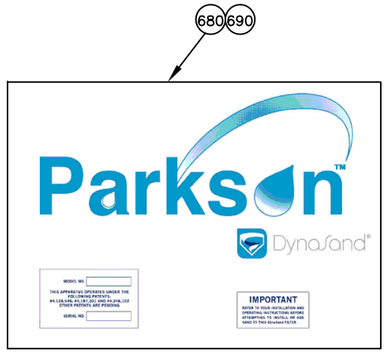
DETAIL F



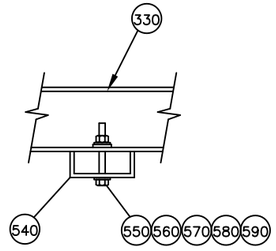
DRAIN & ANCHORAGE DETAIL



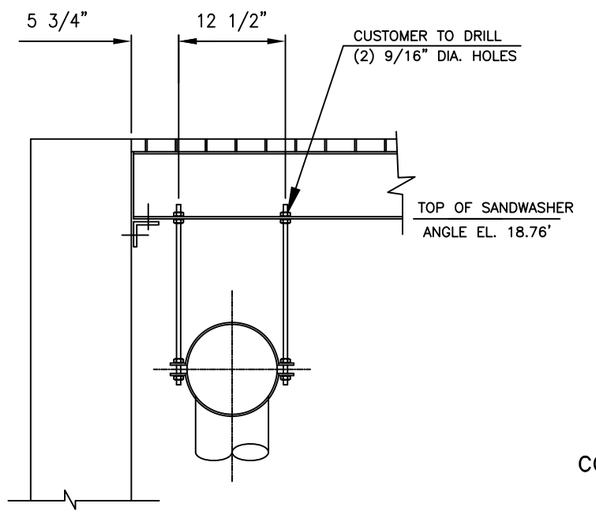
DETAIL G



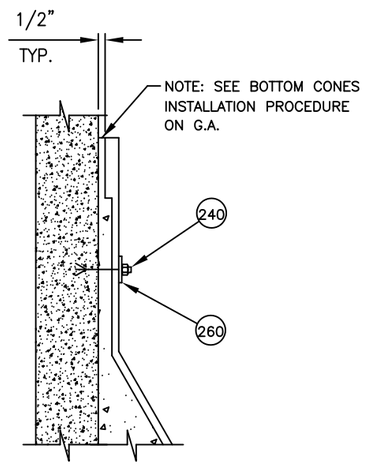
CUSTOMER TO DETERMINE LOCATION
FOR THESE ITEMS (HARDWARE PROVIDED)



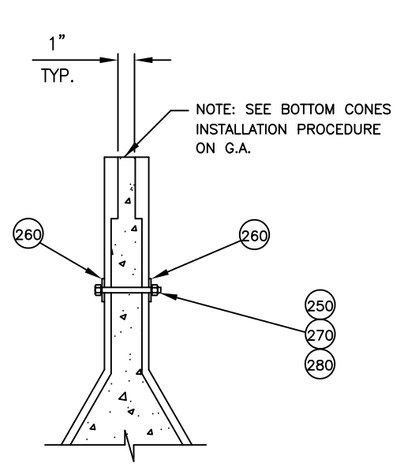
DETAIL H



DETAIL J



CONE TO WALL DETAIL



CONE TO CONE DETAIL

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL
__INFORMATION __CERTIFIED

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DRAWN BY	DATE
FJC	6–15–22
CHECKED BY	DATE
SCALE	SIZE
1/X"=1"	B

Parkson

PROJECT NAME
P01501867
JEFFERSON
GA

REFERENCE INFORMATION

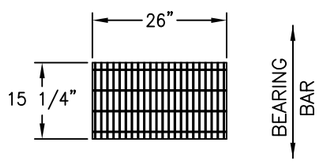
TITLE
DYNASAND® FILTER™
DSF, 50FT2, DBTF, (10) MODULES
GENERAL ARRANGMENT – DETAILS

DRAWING NO
P0150186701
SHEET 6 OF 6

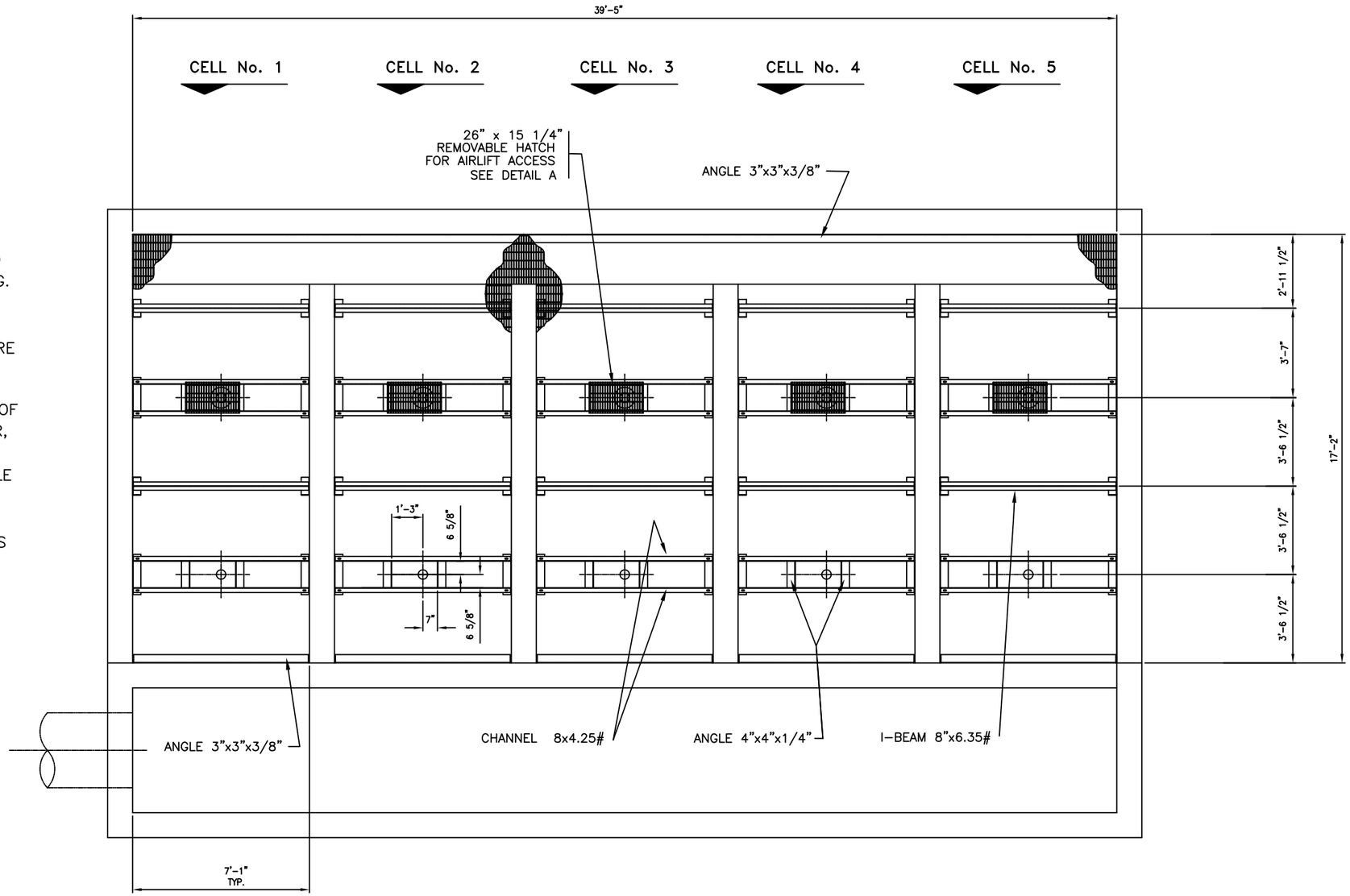
REV
—

NOTES:

1. GRATING SHALL BE ALUMINUM 1 1/2"X 3/16"X1 3/16" C.C. TYPE 19-SG-4 BY OHIO GRATING INC. OR APPROVED EQUAL.
2. THE ENDS OF ALL BEARING BARS SHALL BE BANDED WITH NO SHARP EDGES ALLOWED. WELD EVERY THIRD BAR TO BANDING.
3. ALL BARS MUST BE IN ALIGNMENT AFTER ASSEMBLY. (BOTH BEARING AND CROSS BARS).
4. VENDOR & INSPECTION TO LAYOUT GRATING PANELS TO ASSURE DIMENSIONS AND THAT HATCHES FIT ALL CUTOUTS BEFORE SHIPPING.
5. VENDOR TO TAG EACH GRATING SECTION WITH A WEATHERPROOF TAG INDICATING DRAWING NUMBER. GRATING SECTION NUMBER, ORIENTATION.
6. GRATING VENDOR TO SPECIFY QUANTITIES AND PROVIDE SADDLE CLIPS, WITH FASTENERS AND THEIR LOCATIONS.
7. GRATING SUPPORTS SHOWN FOR INFORMATION ONLY.
8. (10) COVERS REQUIRED. ALLOW 1/4 IN. GAP AROUND COVERS
9. GRATING FABRICATOR TO ADD PARKSON DRAWING NUMBER P0150186705 Sh. 2 OF 2 ON THE APPROVAL DRAWINGS. PLEASE SUBMIT ELECTRONIC DRAWINGS FOR APPROVAL.
10. EACH SECTION OF GRATING SHALL BE EASILY REMOVED BY ONE PERSON.



DETAIL A
(10) REQ'D



PLAN VIEW

REV	DESCRIPTION	DATE	BY

__PRELIMINARY X APPROVAL

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DRAWN BY: FJC	DATE: 2/22/22
CHECKED BY:	DATE:
SCALE: 1/X"=1"	SIZE: B

Parkson™

PROJECT NAME: P01501867 JEFFERSON, GA

REFERENCE INFORMATION:

TITLE: DYNASAND® FILTER™ DSF, 50FT2, DBTF, (10) MODULES GRATING ARRANGEMENT

DRAWING NO: P0150186705 SHEET 1 OF 2

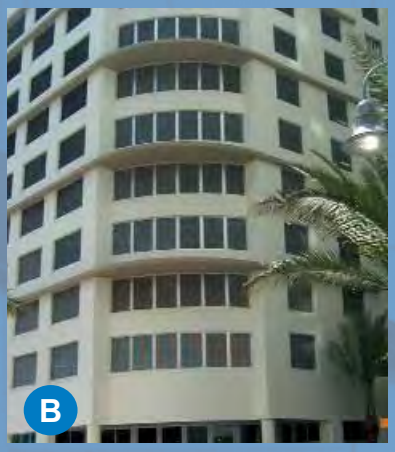
REV: —

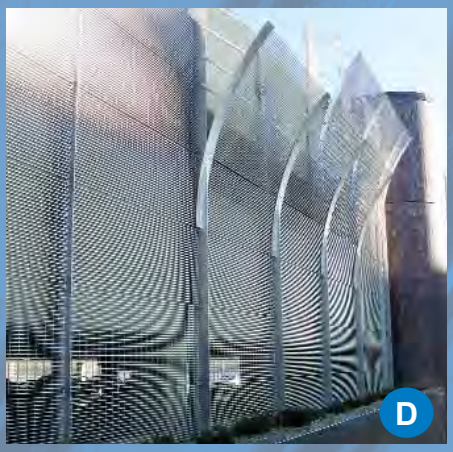
OHIO GRATINGS, INC.

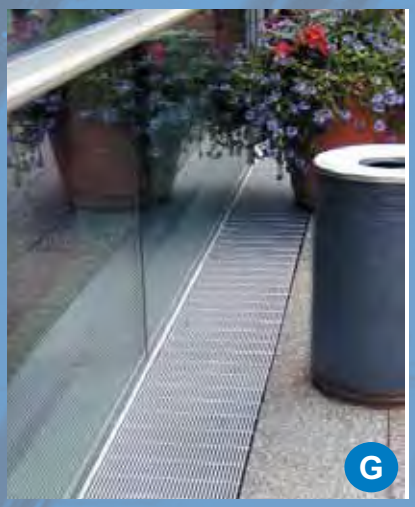
PRODUCT CATALOG

ALUMINUM

It's Not Just For Industrial Use Anymore







A **Minneapolis-St. Paul Airport**
- Security Fencing

B **Metropolis Project**
- Building Facade

C **Chipotle Restaurant**
- Sun Screen

D **Minneapolis Garage**
- Building Facade

E **ASLA Greenroof H.Q.**
- Green Roof Flooring

F **NC Wildlife Education H.Q.**
- Sun Screen

G **Corning Glass, NY**
- Drainage Grating

ALUMINUM PRODUCTS

Aluminum Rectangular, I Bar and LITEBAR®

SG Series - SGI Series - SGLi Series

A type of pressure locked grating made by permanently attaching cross bars to bearing bars through a pressure applied swaging process. Bearing bars are either rectangular or "I" shaped and range in size from 1″ through 2½″. Both Rectangular Bar and I-Bar are offered in 1 3/16″ and 15/16″ spacings, as well as ADA (July 1991) compliant spacings. Cross bars are available on 4″ and 2″ centers. A serrated surface (rectangular bar) or striated surface(I-Bar) is available for skid resistance.

Aluminum Flush Top - SGF Series

A type of pressure locked grating in which the cross bars are in the same plane relative to the top surface of the grating. Bearing bar sizes range from 1″ x ⅛″ through 2½″ x 3/16″ in ¼″ increments. Bearing bar spacing of 1 3/16″, 15/16″, 11/16″ and 7/16″ c.c. and cross bar spacing of 4″ or 2″ are available. Where skid resistance is desired, a serrated surface can be provided. ALUMINUM FLUSH TOP is available in spacings which provide a ¼″ or ½″ opening in conformance with provisions of the Americans With Disabilities Act (July 1991) for grating products.

Aluminum Dove Tail - ADT Series

A type of pressure locked grating whereby bearing bars and cross bars are precision slotted, assembled in egg-crate fashion, and hydraulically pressed together to form a panel grid. Bearing bars range from 1″ x 1/8″ through 2 1/2″ x 3/16″ in 1/4″ increments. Grating spacings for Aluminum Dove Tail include the standards, as well as the ADA (July 1991) compliant spacings. Many engineers prefer the bi-directional, rectilinear look and feel of Aluminum Dove Tail grating.

Aluminum Riveted - AR Series

A type of aluminum grating which combines straight bearing bars and bent connecting bars riveted together at their contact points. Riveted grating, although being the oldest style of industrial footwalk, is still the choice of many engineers due to its reliability and durability. All popular sizes and spacings of riveted grating are manufactured by Ohio Gratings with an emphasis on quality and service.

Aluminum Plank

A type of aluminum grating which is available in 6″ wide sections, and either plain sided or interlocking. Plank can be provided in sections up to 26′ 0″ in length, or fabricated per plans and specs. Plank grating is available unpunched as an economical and structurally superior substitute for aluminum checkerplate, or with a variety of punch/patterns.

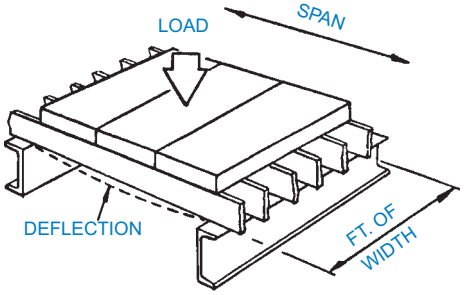
ALUMINUM DESIGN CRITERIA

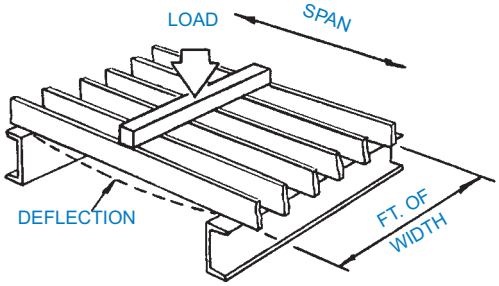
The tables of safe loads which follow have been computed using the following design parameters:

U = Uniform Load – lbs/ft²
C = Concentrated Load – lbs/ft of grating width
S = Section Modulus – in³/ft of grating width
I = Moment of Inertia – in⁴/ft of grating width
L = Simple Clear Span – feet
D = Deflection – inches
E = Modulus of Elasticity (10,000,000 psi)
F = Allowable Bending Stress (12,000 psi) – See note below.
M = Bending Moment

Design Service

Available at no charge to the specifying architect/engineer or fabricator, is access to a computer program which provides uniform load and deflection (actual or fraction of span) analysis of grating products. Just call, write or fax your design criteria – loading, span, allowable deflection, or grating size desired – and we will provide you with the information you require.





	Uniform Load	Concentrated Load
Step 1. Determine M:	$M = \frac{FS}{12}$	$M = \frac{FS}{12}$
Step 2. Determine U or C:	$U = \frac{8M}{L^2}$	$C = \frac{4M}{L}$
Step 3. Check D*:	$D = \frac{5UL\,(L \times 12)^3}{384\,EI}$	$D = \frac{C\,(L \times 12)^3}{48\,EI}$

**Deflection should be limited to ¼" under 100# uniform load to afford pedestrian comfort.*

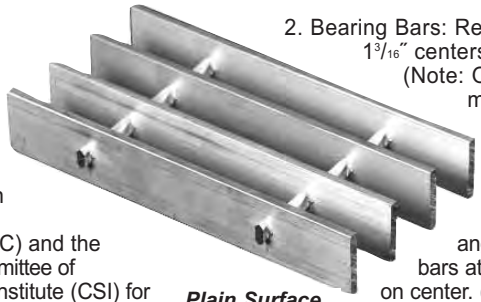
NOTE: *Quite often there is some question as to whether alloy 6063-T6 or 6061-T6 should be the preferred alloy for grating products. The design of aluminum grating for pedestrian loads is deflection limited, rather than strength limited. Although alloy 6061-T6 is stronger than alloy 6063-T6, the Modulus of Elasticity for both alloys is the same: 10,000,000 psi. As a result, equal loads will produce the same deflection, provided, of course that the yield strength is not exceeded.*

Aluminum Grating is best suited for use in conjunction with pedestrian traffic, and for very light, rubber pneumatic tired rolling traffic (carts, dollies and hand trucks). For other rolling loads (forklifts, cars, trucks, etc.) see the Heavy Duty Steel Grating section, page 73.

SG SERIES

PRODUCT SPECIFICATION GUIDE

How to Specify:
The information below provides a specification format for architectural and engineering specification sections that, when applied, will be consistent with the Three-Part Section Format for Construction Specifications Canada (CSC) and the Technical Documents Committee of Construction Specifications Institute (CSI) for specifications serving the construction industry. These specifications are intended for use as a guide spec for architects and engineers, and may need to be altered or modified to fit the specific conditions of the application in question.



Plain Surface

PART 1: GENERAL...

1.1 Scope
The contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install grating, stair treads and frames.

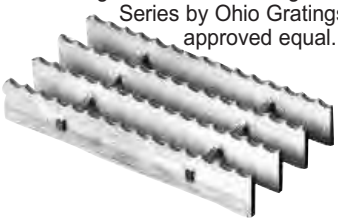
1.2 Quality Assurance
A.1. Comply with applicable provisions and recommendations of the following: NAAMM Metal Bar Grating Manual designated ANSI/NAAMM MBG 531 (Aluminum and Light Duty Steel and Stainless Steel Grating) and MBG 532 (Heavy Duty Steel Grating).
2. Aluminum: ASTM B221, Aluminum Alloy, Extruded Bars, Rods, Wire, Shapes and Tubing.

B.1. Take field measurements prior to preparation of shop drawings and fabrication where required, to ensure proper fitting of the work.

1.3 Submittals
A. The contractor shall submit for approval shop drawings for the fabrication and erection of all work. Include plans, elevations, and details of sections and connections. Show type and location of all fasteners.
B. The contractor shall submit the manufacturer's specifications, load tables, anchor details and standard installation details.

PART 2: PRODUCT...

1. Grating: Aluminum Rectangular Bar SG Series by Ohio Gratings, Inc., or approved equal.



Serrated Surface

2. Bearing Bars: Rectangular Bar on $1^{3}/_{16}$″ centers maximum. (Note: Other spacings may be specified at the discretion of the architect/engineer.)
3. Cross Bars: Locked at right angles to bearing bars at a maximum of 4" on center. (Note: 2″ cross bar centers may be specified at the discretion of the architect /engineer.)
4. Surface: Plain. (Note: A serrated surface may be specified for maximum skid resistance.)
5. Loading: Grating to carry a pedestrian loading equal to a uniform load of 100# per square foot over the required clear span with deflection not to exceed $^{1}/_{4}$″. (Note: Alternate loading requirements may be specified at the discretion of the architect /engineer.)
6. Finish: Mill finished.
7. Fabrication and Tolerances: In accordance with the NAAMM Metal Bar Grating Manual.

PART 3: EXECUTION...

3.1 Installation
A. Prior to grating installation, contractor shall inspect supports for correct size, layout and alignment. Any inconsistencies between contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the architect or owner's agent prior to grating placement.

B. Install grating in accordance with shop drawings and standard installation clearances as recommended by the NAAMM Metal Bar Grating Manual.

C. Cutting, Fitting and Placement.
1. Perform all cutting and fitting required for installation. Grating shall be placed such that cross bars align.
2. Wherever grating is pierced by pipes, ducts and structural members, cut openings neatly and accurately to size and weld a rectangular band bar of the same height and material as bearing bars.
3. Cutouts for circular obstructions are to be at least 2″ larger in diameter than the obstruction. Cutouts for all piping 4″ or less shall be made in the field.
4. All rectangular cutouts are to be made to the next bearing bar beyond the penetration with a clearance not to exceed bearing bar spacing.
5. Utilize standard panel widths wherever possible.

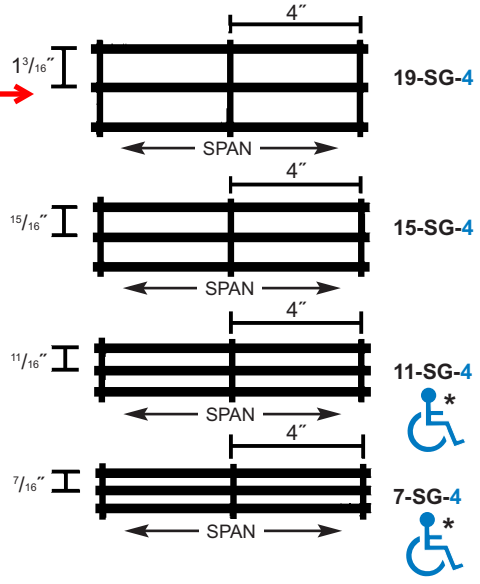
D. Protection of Aluminum from Dissimilar Materials:
1. Where aluminum surfaces come into contact with dissimilar metals, surfaces shall be kept from direct contact by painting the dissimilar metal with one coat of bituminous paint or other approved insulating material.
2. Where aluminum surfaces come into contact with dissimilar materials such as concrete, masonry or lime mortar, exposed aluminum surfaces shall be painted with one coat of bituminous paint or other approved insulating material.

3.2 Grating Attachment
Use anchorage devices (saddle clips) (grating clamps) (plank clips) (plank lugs) (countersunk lands) (Z clips) or (anchor blocks) and fasteners to secure grating to supporting members or prepared openings.

Grating Profiles Available...

SG Series - Aluminum Rectangular Bar

All profiles shown below are also available with 2" cross bar centers. Product numbers would be 19-SG-2, 15-SG-2, 11-SG-2 and 7-SG-2



*Note: *Conforms with the spacing requirements of ADA (July 1991) when installed with the elongated opening perpendicular to the dominant direction of travel.*
See ADA Guidelines

ALUMINUM RECTANGULAR BAR

SG SERIES

Product Applications...

The most widely used aluminum pressure locked grating is the rectangular bar SG series. The square cross bars are assembled through punched diamond shaped holes in rectangular bearing bars and are permanently locked into place by a swaging process.
It provides clean crisp lines using recessed cross bar and eliminates the need for any type of welding to form the panels. By using the most modern technology available, swaged bar grating allows for a variety of spacings including those that conform to the "Americans with Disabilities Act". Because of its aesthetic appeal and the ability to meet tight tolerances, this product is often used for architectural applications. Slip resistant surfaces are available.

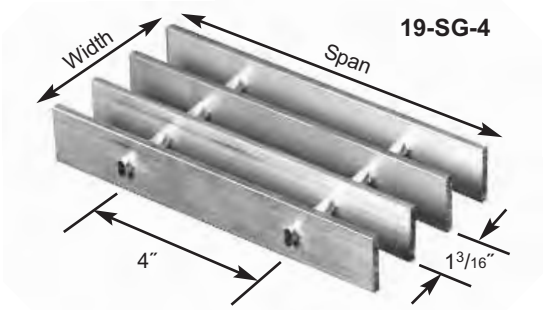
▲ Dept. of Workers Compensation
- Columbus, OH

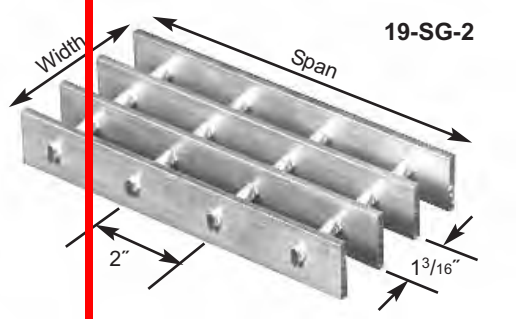
◀ 4th Street Live
- Louisville, KY

▲ LeMay WWTP
- St. Louis, MO

19 SPACE

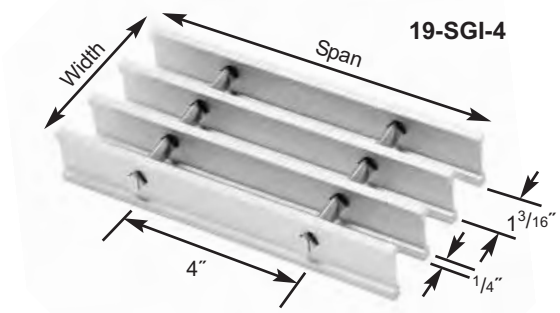
ALUMINUM RECTANGULAR BAR – 19-SG-4 ▪ 19-SG-2

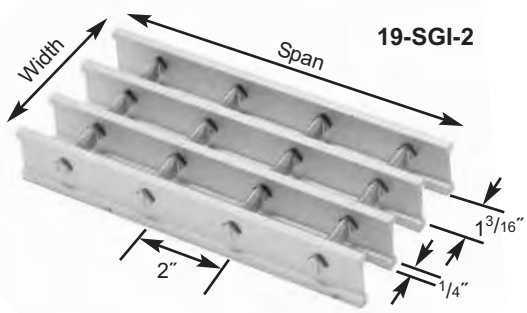




% Open Area*		
Bars	1/8″	3/16″
4″ cc	85%	80%
2″ cc	81%	77%

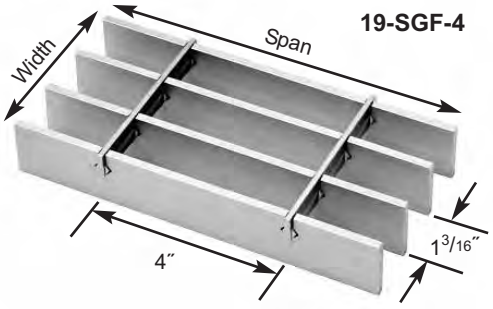
ALUMINUM I-BAR – 19-SGI-4 ▪ 19-SGI-2

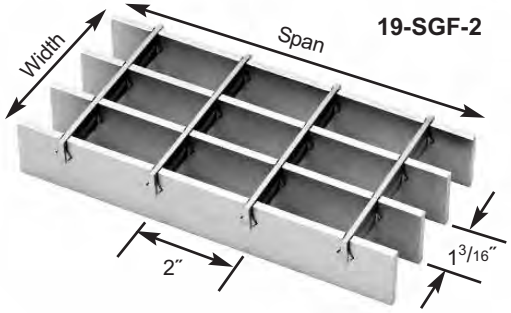




% Open Area*	
4″ cc	80%
2″ cc	77%

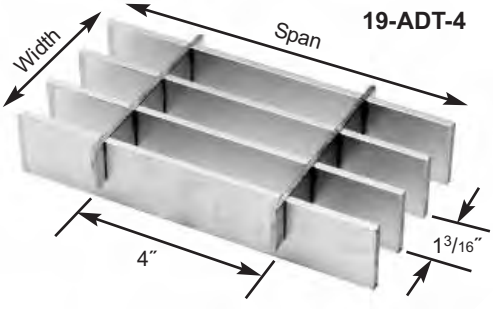
ALUMINUM FLUSH TOP – 19-SGF-4 ▪ 19-SGF-2

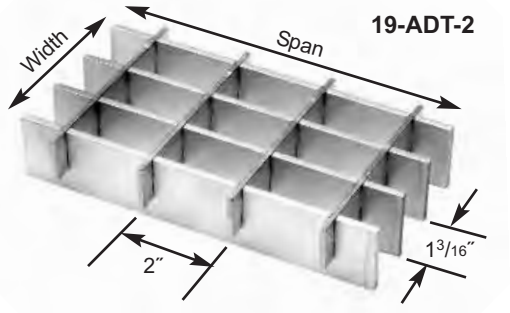




% Open Area*		
Bars	1/8″	3/16″
4″ cc	85%	80%
2″ cc	81%	77%

ALUMINUM DOVE TAIL – 19-ADT-4 ▪ 19-ADT-2





% Open Area*		
Bars	1/8″	3/16″
4″ cc	86%	81%
2″ cc	84%	79%

ALUMINUM LOAD TABLES

19 SPACE

Bar Size, Inches	Ped Span, Inches	Wt.* Lbs. Sq. Ft.	Sec. Prop Sx*, in³ / Ix*, in⁴		Clear Span 2′- 0″	2′- 6″	3′- 0″	3′- 6″	4′- 0″	4′- 6″	5′- 0″	5′- 6″	6′- 0″	6′- 6″	7′- 0″	8′- 0″
1 x 1/8	39	1.71	0.211	U	421	269	187	137								
				D	0.144	0.225	0.324	0.439								
			0.105	C	421	337	281	241								
				D	0.115	0.180	0.259	0.353								
1 x 3/16	44	2.46	0.316	U	632	404	281	206	158							
				D	0.144	0.225	0.324	0.441	0.576							
I-Bar		1.99	0.158	C	632	505	421	361	316							
				D	0.115	0.180	0.259	0.353	0.461							
1 1/4 x 1/8	47	2.08	0.329	U	658	421	292	215	164							
				D	0.115	0.180	0.259	0.353	0.459							
			0.206	C	658	526	439	376	329							
				D	0.092	0.144	0.208	0.282	0.369							
1 1/4 x 3/16	52	3.01	0.493	U	987	632	439	322	247	195						
				D	0.115	0.180	0.259	0.353	0.461	0.583						
I-Bar		2.34	0.308	C	987	789	658	564	493	439						
				D	0.092	0.144	0.207	0.282	0.368	0.467						
1 1/2 x 1/8	53	2.46	0.474	U	947	606	421	309	237	187						
				D	0.096	0.150	0.216	0.294	0.384	0.486						
			0.355	C	947	758	632	541	474	421						
				D	0.077	0.120	0.173	0.235	0.307	0.389						
1 1/2 x 3/16	59	3.56	0.711	U	1421	909	632	464	355	281	227					
				D	0.096	0.150	0.216	0.294	0.384	0.487	0.599					
I-Bar		2.70	0.533	C	1421	1137	947	812	711	632	568					
				D	0.077	0.120	0.173	0.235	0.307	0.389	0.480					
1 3/4 x 3/16	66	4.12	0.967	U	1934	1238	860	632	484	382	309	256	215			
				D	0.082	0.129	0.185	0.252	0.329	0.417	0.514	0.623	0.741			
I-Bar		3.06	0.846	C	1934	1547	1289	1105	967	860	774	703	645			
				D	0.066	0.103	0.148	0.202	0.263	0.333	0.412	0.498	0.593			
2 x 3/16	73	4.68	1.263	U	2526	1617	1123	825	632	499	404	334	281	239		
				D	0.072	0.113	0.162	0.221	0.288	0.364	0.450	0.544	0.649	0.760		
I-Bar		3.43	1.263	C	2526	2021	1684	1444	1263	1123	1011	919	842	777		
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.518	0.608		
2 1/4 x 3/16	80	5.24	1.599	U	3197	2046	1421	1044	799	632	512	423	355	303	261	
				D	0.064	0.100	0.144	0.196	0.256	0.324	0.400	0.484	0.576	0.677	0.784	
I-Bar		3.75	1.798	C	3197	2558	2132	1827	1599	1421	1279	1163	1066	984	914	
				D	0.051	0.080	0.115	0.157	0.205	0.259	0.320	0.387	0.461	0.541	0.628	
2 1/2 x 3/16	87	5.79	1.974	U	3947	2526	1754	1289	987	780	632	522	439	374	322	247
				D	0.058	0.090	0.130	0.176	0.230	0.292	0.360	0.436	0.519	0.609	0.705	0.923
I-Bar		4.15	2.467	C	3947	3158	2632	2256	1974	1754	1579	1435	1316	1215	1128	987
				D	0.046	0.072	0.104	0.141	0.184	0.233	0.288	0.348	0.415	0.487	0.565	0.737

U - Safe uniform load in pounds/sq. ft.

C - Safe concentrated load in pounds/ft. grating width

D - Deflection in inches

Loads and deflections given in this table are theoretical, and are based on a unit stress of 12,000 psi.

*Based on 10.105 bars/ft. of grating width. Bearing bars 1 3/16″ c.c. Add .3 lbs./sq. ft. for 19-SG-2. Note: Grating for spans to the left of the heavy line have a deflection less than 1/4″ for uniform loads of 100 lbs./sq. ft. This is the maximum deflection to afford pedestrian comfort and can be exceeded for other types of load at the discretion of the engineer. The actual Ped (pedestrian) Span under this condition is shown above for each size of grating. When serrated grating is specified, the depth of grating required for a specific load will be 1/4″ greater than that shown in these tables.

Panel Width Chart (in.) - 19-SG-4 19-SG-2, 19-SGLi-4 19-SGLi-2, 19-SGF-4 19-SGF-2, 19-ADT-4 19-ADT-2

Dimensions Are Out-to-Out of Bearing Bars**

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
3/16″ Bars	1 3/8	2 9/16	3 3/4	4 15/16	6 1/8	7 5/16	8 1/2	9 11/16	10 7/8	12 1/16	13 1/4	14 7/16	15 5/8	16 13/16	18
No. of Bars	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
3/16″ Bars	19 3/16	20 3/8	21 9/16	22 3/4	23 15/16	25 1/8	26 5/16	27 1/2	28 11/16	29 7/8	31 1/16	32 1/4	33 7/16	34 5/8	35 13/16

**Add 1/4″ for extended cross bars. Deduct 1/16″ for 1/8″ bearing bars. Standard panel widths indicated in blue.

Panel Width Chart (in.) - 19-SGI-4 19-SGI-2 Dimensions Are Out-to-Out of Bearing Bars**

No. of Bars	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1/4″ Flange	1 7/16	2 5/8	3 13/16	5	6 3/16	7 3/8	8 9/16	9 3/4	10 15/16	12 1/8	13 5/16	14 1/2	15 11/16	16 7/8	18 1/16
No. of Bars	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1/4″ Flange	19 1/4	20 7/16	21 5/8	22 13/16	24	25 3/16	26 3/8	27 9/16	28 3/4	29 15/16	31 1/8	32 5/16	33 1/2	34 11/16	35 7/8

**Bar thickness is 1/4″ at top and bottom. Add 1/4″ for extended cross bars. Standard panel widths indicated in blue.

Material List

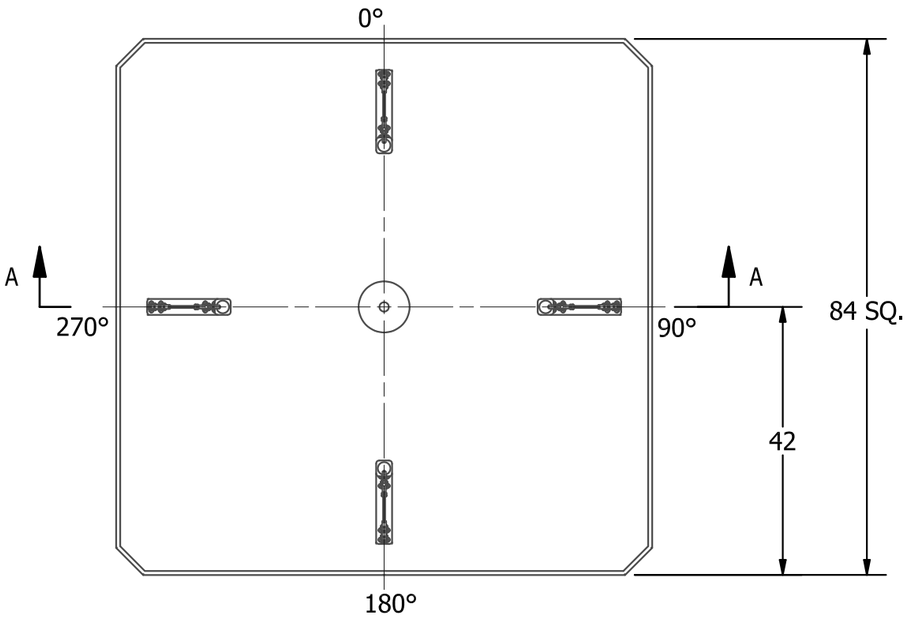
Project : Sandard Part

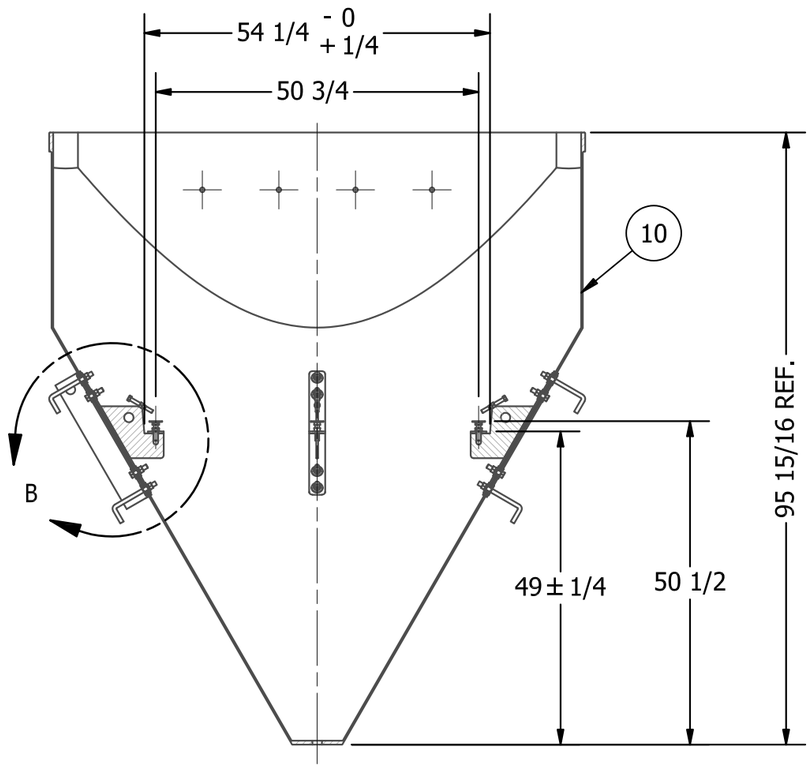
E-Item : 1025121 Cone,50Ft2,No,Drain,304

E-Item Revision: 2 updated drawing, no RTM

Drawing/Spec Reference: 1025121B.dwg

Pos.	Item	Rev.	Drawing/Spec	Dwg Size	Description	Mat'l	Net Quantity	Unit
10	1012252	5	1012252C.dwg		Cone,50Ft2,n/Drain,n/opngFRP	FRP	1	ea
20	1025119	3	1025119_2.pdf		Bracket,Suprt,Feed,Assy,50FT2	304L	4	ea
30	1001037	2	1F-2065.dwg		Bracket,Cone,External,50FT2	A36	4	ea
40	0000949	0			Bolt,Hex,5/8-11x2 1/2,316	316	8	ea
50	0001474	0			Washer,Flat,5/8,316	316	24	ea
60	0000664	0			Nut,Hex,5/8-11,316	316	16	ea
70	0000763	0			Washer,Lock,5/8,316	316	16	ea
80	1001309	0	1F-2320-01.dwg		Bolt,Anchor,5/8,304,50Ft2,Mod	304	8	ea





SECTION A-A

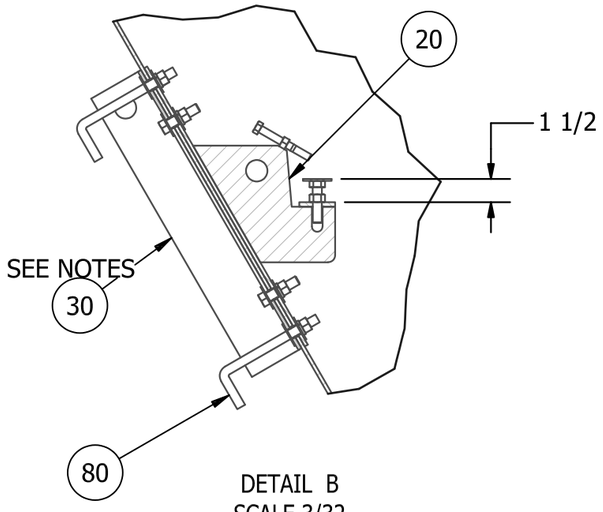
SHOP NOTES:

1. DRILL (4) 13/16" Ø HOLES TO MATCH ITEMS 20 AND 30 AT LOCATIONS 0°, 90°, 180° AND 270°.
2. APPLY ONE COAT OF RESIN AROUND ALL DRILLED HOLES AND OPENINGS TO AVOID DELAMINATION OF THE FIBERGLASS.

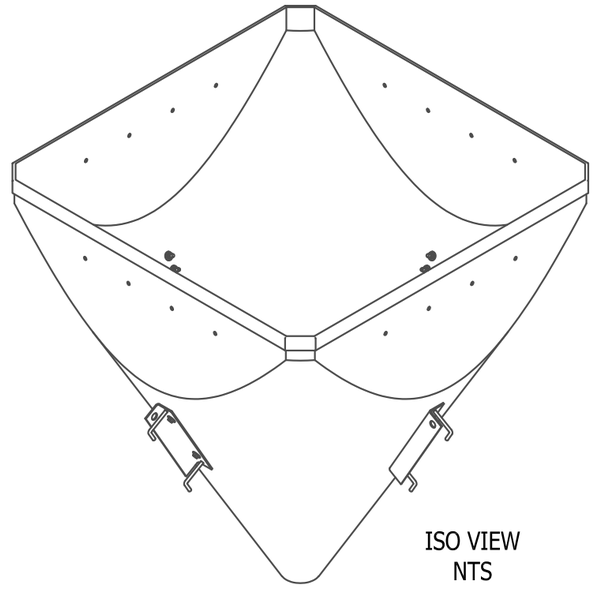
CONTRACTOR NOTES:

1. INSTALL ITEMS 20 AND 30 WITH THE HARDWARE PROVIDED AS SHOWN ON DETAIL "B". USE (2) BOLTS PER BRACKET THRU INNER HOLES ONLY, LEAVE OUTER HOLES EMPTY.
2. ALL LOWER CONE HOLD DOWN BRACKETS (ITEM 20) TO BE AT SAME ELEVATION WITHIN 1/4".

WEIGHT = 445 lbs



DETAIL B
SCALE 3/32



ISO VIEW
NTS

REV	DESCRIPTION	BY	DATE	ECO	CHK
B	REMOVED RTM SYSTEM	RJP	10/13/15	007161	FJC
A	REMOVED BOM FROM DRW	RJP	5/19/15		-

REVISION SCHEDULE

TOLERANCES Except where noted	
3-FIG DEC	±.030
2-FIG DEC	±.06
ANGULAR	±1/2°
MAX EDGE RAD	.13
WELD SIZE	1/8
MACHINED SURFACES NOT TO EXCEED	150

DRAWN BY	DATE
chinmayv	7/25/2010
CHECKED BY	DATE
FJC	7/25/2010
SCALE	WEIGHT
1/24"=1"	445 lbmass
ER:	SIZE
-	B

Parkson™

TITLE
50 FT2 MODULE
CONE ASSEMBLY, INNER, NO DRAIN

DRAWING NO: 1025121

REV B

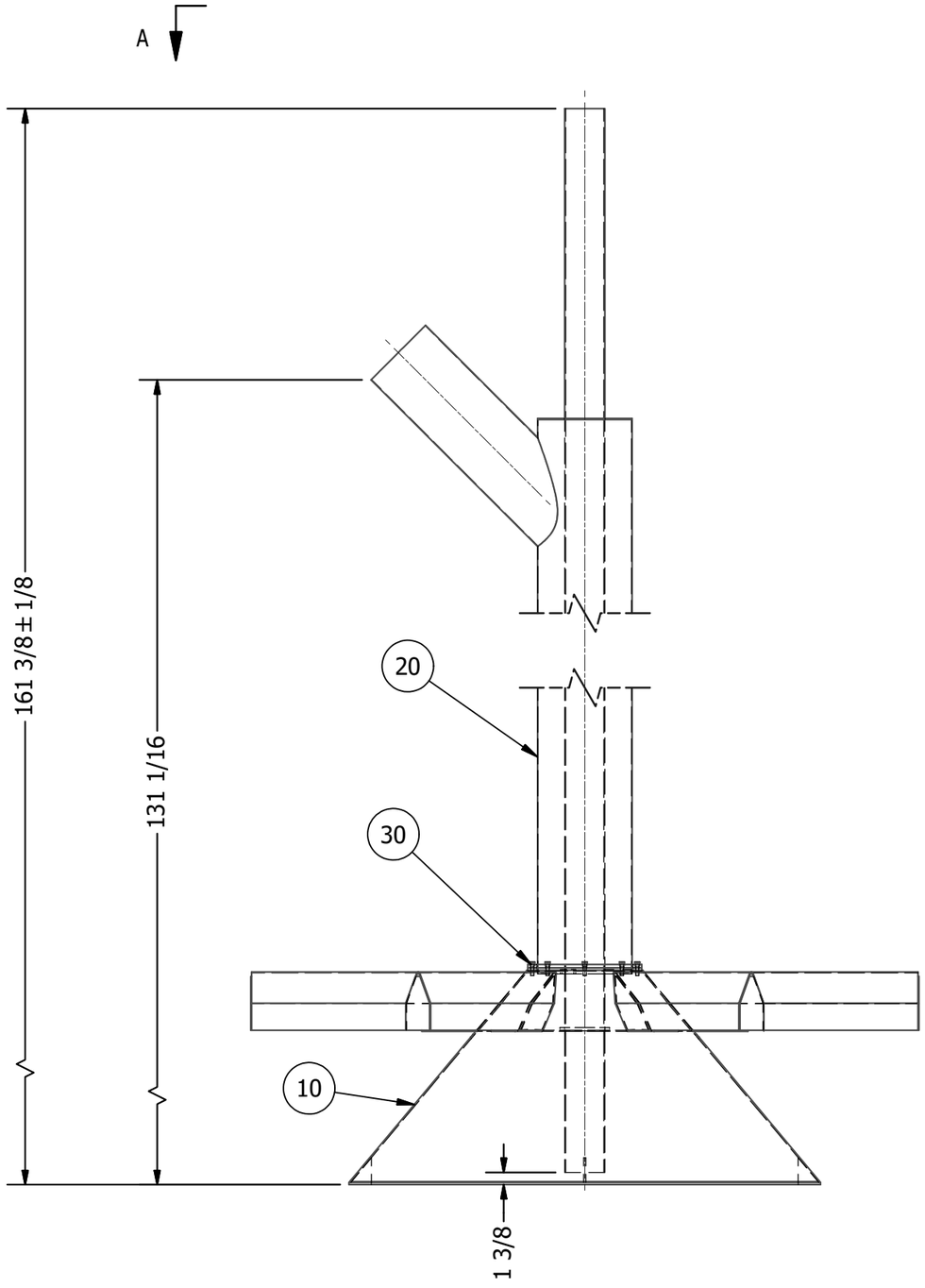
SHEET 1 OF 1

Single Level EBOM

Date 03-04-22 (10:17:07)

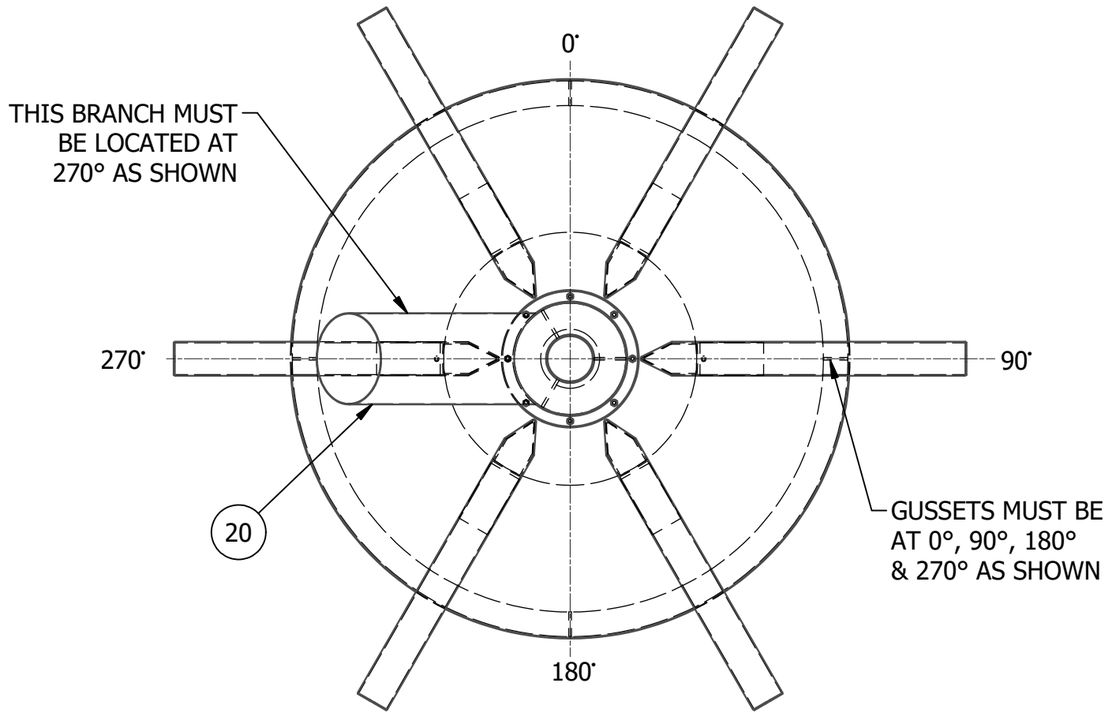
Project		
Engineering Item	**1010395**	**Feed Assembly,50,2pc,DBTF**
Engineering Item Revision	**6**	**Change dwg Rev. #**
Revision Status	**Approved by Production**	
Drawing	**1010395C.dwg**	
BOM Quantity	**1**	**ea**

Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length [in]	Width [in]	No. of Units	Net Quantity	Unit
10	1011148 Lower,Cone,Detail,DSF50,2p,Mod	4	1011148E.dwg	50 Mod	304L	M				1.0000	ea
20	1011147 Feed Pipe,Weldment,50,2pc,DBTF	2	1011147D.dwg		304L	M				1.0000	ea
30	0000115 Bolt,Hex,3/8-16x1 1/4,316	0		3/8-16	316	P				8.0000	ea



NOTES:

1. WEIGHT: 420 lbs.
2. ITEM #20 MUST BE PERPENDICULAR TO THE BOTTOM OF ITEM #10.
3. ITEM #20 MUST BE LOCATED AS SHOWN IN VIEW A-A IN REF. TO ITEM #10.



VIEW A-A

REV	DESCRIPTION	BY	DATE	ECO	CHK
C	GENERAL REVISIONS	CDV	04/15/20	007818	FJC
B	REMOVED 1/16" GAP BETWEEN ITEM 10 & 20	RJP	1/9/18	007460	FJC
A	REMOVED BOM FROM DRW	RJP	5/19/15		-

REVISION SCHEDULE

TOLERANCES Except where noted	
FRACTION	±.1/8"
.XX	±.1/16"
.XXX	±.030"
ANGULAR	±1/2°
MAX EDGE RAD	.13
WELD SIZE	1/8
MACHINED SURFACES	150
NOT TO EXCEED	

DRAWN BY	DATE
chinmayv	5/30/2007
CHECKED BY	DATE
FJC	5/30/2007
SCALE	WEIGHT
NTS	-
ER:	SIZE
	B

Parkson™

TITLE
FEED ASSEMBLY, 50, 2 PC, DBTF
GENERAL ASSEMBLY

DRAWING NO: 1010395 REV C

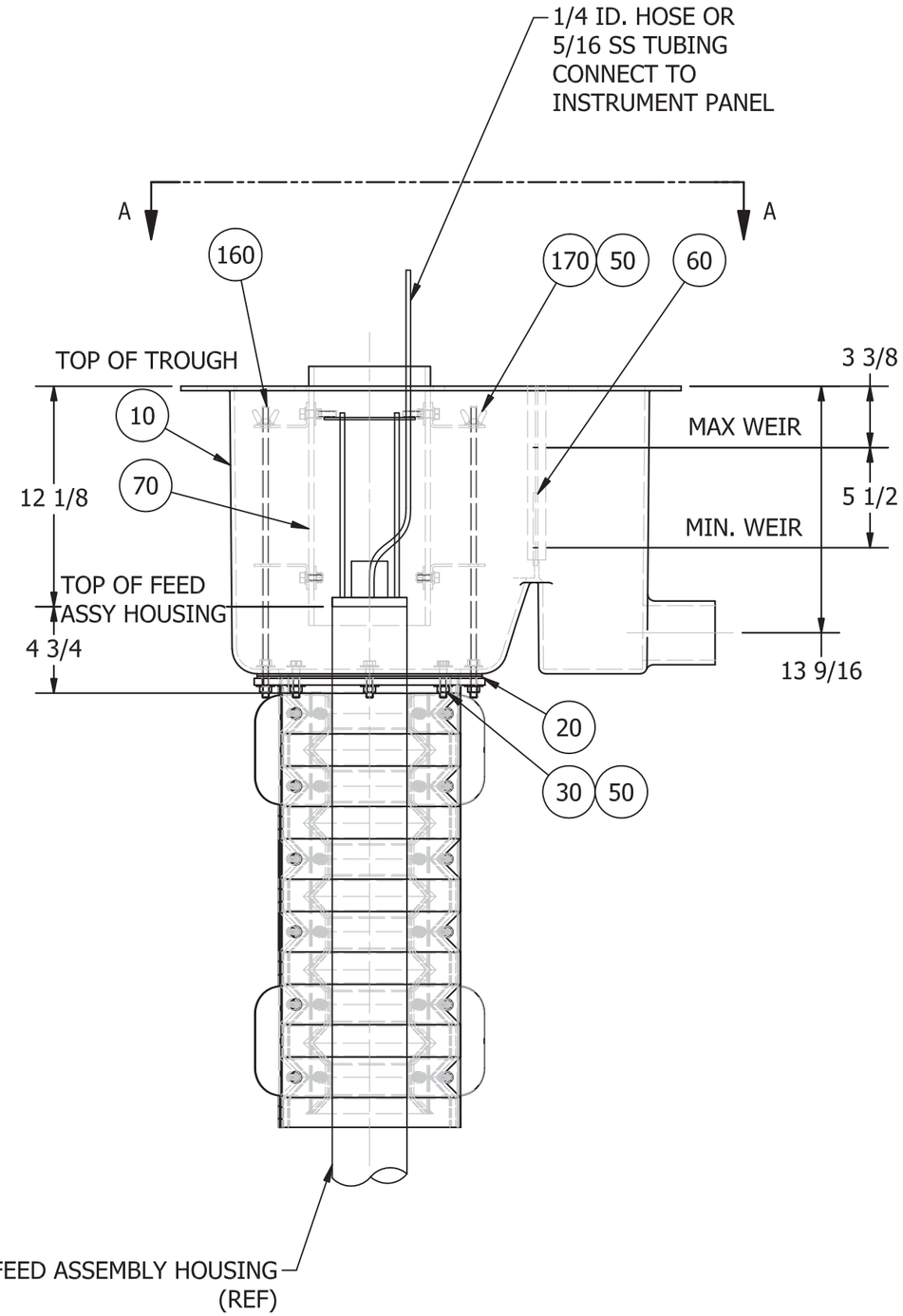
SHEET 1 OF 1

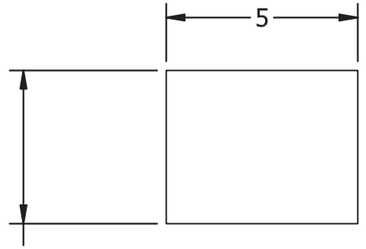
Material List

Date 08-27-2018 07:35			Mat'l List		Page 1			
Production					Company 100			
			Project : Sandard Part					
			E-Item : 1004649 - Sand,Washer,Assy,DSF-50 Mod					
			E-Item Revision: 4 new drw, update Item 170,					
			Drawing/Spec Reference: 1004649A.dwg					
Pos.	Item	Rev.	Drawing/Spec	Dwg Size	Description	Mat'l	Net Quantity	Unit
10	1003464	4	1003464A.dwg		Trough,Reject,DSF-38&50,FRP	FRP	1	ea
20	1001952	3	001296-01.dwg		Gasket,Reject Trough,Poron	Poron	1	ea
30	0000662	0			Nut,Hex,3/8-16,316	316	4	ea
40	0003255	0			Bolt,Hex,FullThrd,3/8-16x1 3/4	316	6	ea
					316SS			
50	0000690	0			Washer,Flat,3/8,316	316	16	ea
					ALT - 3024-116/6			
60	1012569	1	1012569.dwg		Plate,Weir,1/4x5,4Pc Set,	PVC	1	ea
					PVC			
70	1004648	4	1004648A.dwg		Hood,Splash,Assembly,6"		1	ea
80	1012586	0	1012586.dwg		Gasket,Wash Ring,Outer,Right,H	PORON w/	2	ea
					Mat'l 1/8"THK. PORON with Adhesive one side as shown drawing			
					CGR Item 5199548			
90	1012587	0	1012587.dwg		Gasket,Wash Ring,Outer,Left,H	PORON W/	2	ea
					Mat'l 1/8"THK. PORON with Adhesive one side as shown drawing			
					CGR Item 5199550			
100	1001231	2	000768.dwg		Ring,Wash,Inner,2Pc Set,PE	PE	1	set
110	1001230	2	000767.dwg		Ring,Wash,Outer,2Pc Set,PE	PE	1	set
120	0000943	0			Bolt,Hex,1/4-20x1,Nylon	Nylon	24	ea

Material List

Date 08-27-2018 07:35					Mat'l List	Page 2		
Production						Company 100		
E-Item : 1004649					Sand,Washer,Assy,DSF-50 Mod Mak			
Pos.	Item	Rev.	Drawing/Spec	Dwg Size	Description	Mat'l	Net Quantity	Unit
130	0001461	0			Nut,Hex,1/4-20,Nylon	Nylon	24	ea
140	0001471	0			Washer,Flat,1/4,Nylon	Nylon	48	ea
					OLD PART#ZG004OB			
150	1012572	0	1012572-01.dwg		Sand,Washer,Clip,38&50	316 SS	4	ea
					316LSS			
160	1010353	0			Rod,Threaded,3/8-16x16,316	316 SS	2	ea
170	0960370	0			Nut,Wing,3/8-16,Polypropylene	Polyprop	3	ea



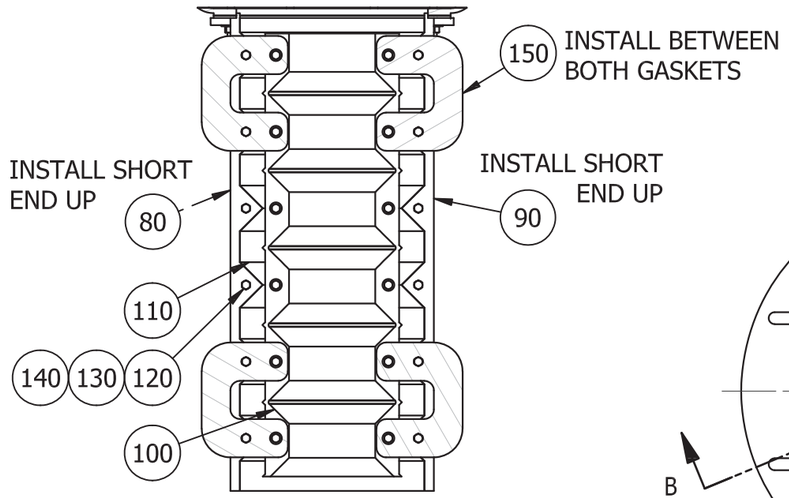


VARIES:
5" WEIR FIXED IN
PLACE. ADD ITEM-60
FOR MORE HEIGHT

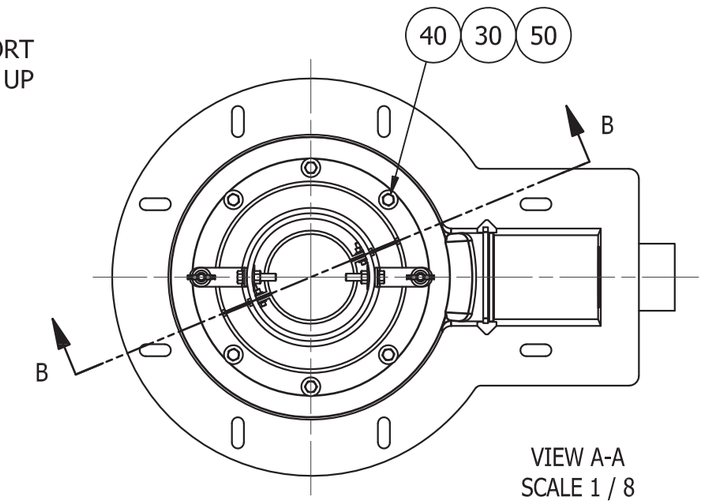
WEIR PLATE
ITEM 60

NOTES TO THE CONTRACTOR:

1. IT IS EXTREMEMLY IMPORTANT THAT THE CONTRACTOR FOLLOWS ALL OF THESE INSTALLATION INSTRUCTIONS TO AVOID POSSIBLE BREAKAGE AND MISALIGNMENT OF THE COMPONENTS.
2. WHEN ASSEMBLING THE INNER WASH RING HALVES WITH THE NYLON HARDWARE, GIVE THE NECESSARY TORQUE (NO MORE THAN 20 IN-LB) TO THE BOLTS SO THAT 1/8 TO 3/16 GAP IS KEPT BETWEEN THE PIECES.
3. WHEN FASTENING THE TROUGH (ITEM 10) TO THE REJECT SUPPORT FRAMES, LEAVE THE BOLTS LOOSE TO ALLOW FOR POSSIBLE MOVEMENT FROM SAND LOADING. TIGHTEN ALL BOLTS AFTER LOADING OF THE SAND.



SECTION B-B
SCALE 1 / 8



VIEW A-A
SCALE 1 / 8

INSTALL TO THE
REJECT SUPPORT FRAME.
REFER TO THE GENERAL
ARRANGMENT DRAWINGS
FOR ORIENTATION.

REV	DESCRIPTION	BY	DATE	ECO	CHK
A	REDRAWN IN INVENTOR, UPDATED DESIGN WAS 012817-01	RJP	10/20/15	007161	

REVISION SCHEDULE

TOLERANCES Except where noted	
3-FIG DEC	±.030
2-FIG DEC	±.06
ANGULAR	±1/2°
MAX EDGE RAD	.13
WELD SIZE	1/8
MACHINED SURFACES NOT TO EXCEED	150

DRAWN BY	DATE
RJP	10/20/2015
CHECKED BY	DATE
<CHKD BY>	
SCALE	WEIGHT
1/8	50 LBS
ER:	SIZE
<NUMBER>	B

Parkson

TITLE
Sand Washer,Assy,DSF-50 Module

DRAWING NO: 1004649 REV A

SHEET 1 OF 1

Single Level EBOM

Date 03-04-22 (10:25:17)

Project		
Engineering Item	**1001019**	**Gauge,Headloss,48,DB,316**
Engineering Item Revision	**2**	**Item 50 was 0001091**
Revision Status	**Approved by Production**	
Drawing	**1001019.dwg**	
BOM Quantity	**1**	**ea**

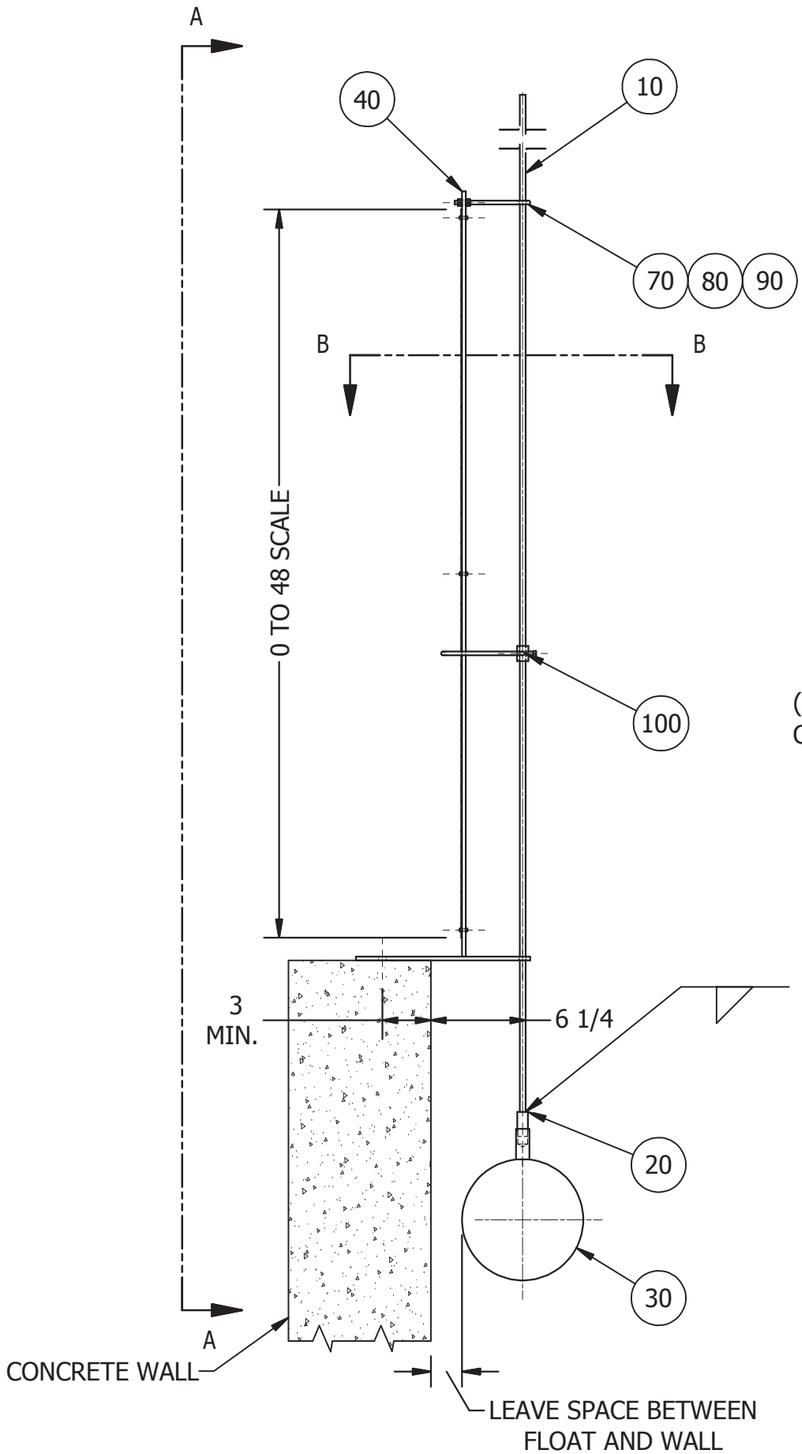
Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length [in]	Width [in]	No. of Units	Net Quantity	Unit
10	0001007 Bar,Round,3/8,316	0		3/8	316	P	132.0000		1	132.0000	in
20	0000029 Plug,Pipe,3/8NPT-150#,316	0		3/8NPT	316	P				1.0000	ea
30	0001136 Float,8x3/8 NPT,McMaster Carr, 9775K18,Polypropylene	0		8x3/8 NPT	Polyprop	P				1.0000	ea
40	1003363 Bracket,Support,Headloss Gauge 48,DB,316	0	003660-01.dwg		316	M				1.0000	set
50	0009718 Rivet,Pop,Klik-Fast,3/16 Klik-Fast Bottonhead Rivet, SSB6-6S	0		3/16	SS	P				3.0000	ea
60	0000189 Ruler,48,Alum,Johnson #J48	0		48	Alum	P				1.0000	ea
70	0000911 Eyebolt,1/4-20x4,1/2 Eye,316 McMASTER CARR# 3032T57	0		1/4-20x4	316	P				1.0000	ea
80	0000658 Nut,Hex,1/4-20,316 ALT - 3026-003/6	0		1/4-20	316	P				2.0000	ea
Item no.	Component Description	Item Rev.	Drawing	Size	Material	Item Type	Length [in]	Width [in]	No. of Units	Net Quantity	Unit
90	0000754 Washer,Lock,1/4,316 ALT - 3025-002/6	0		1/4	316	P				2.0000	ea

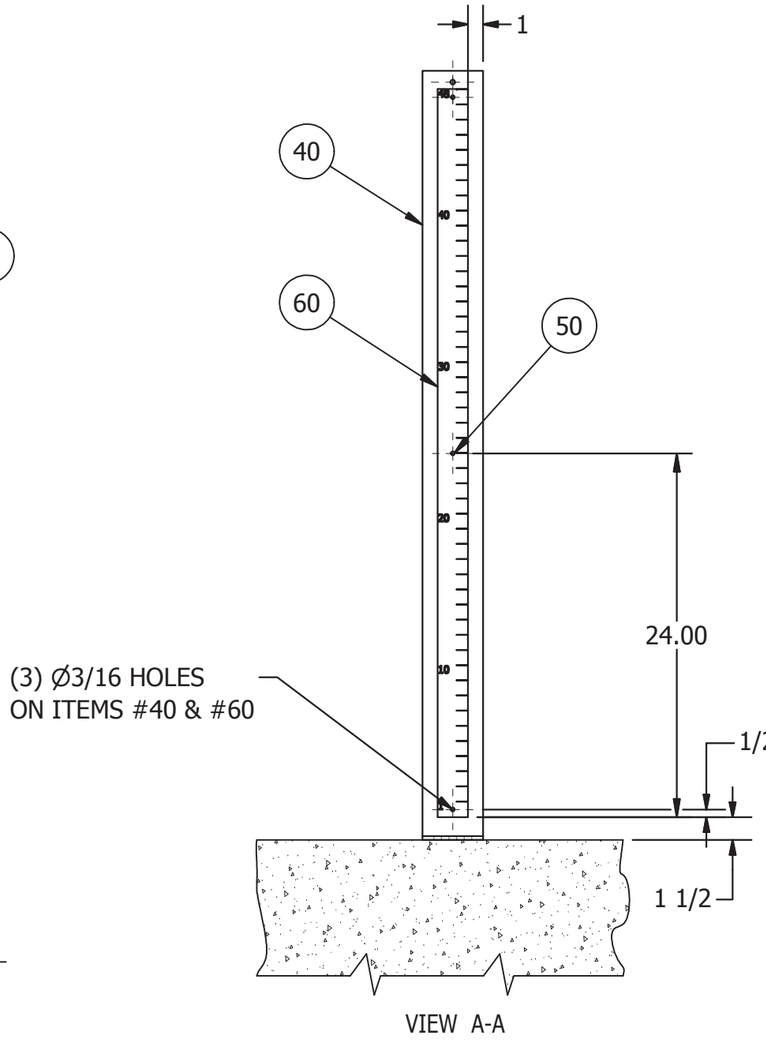
Single Level EBOM

Date 03-04-22 (10:25:17)

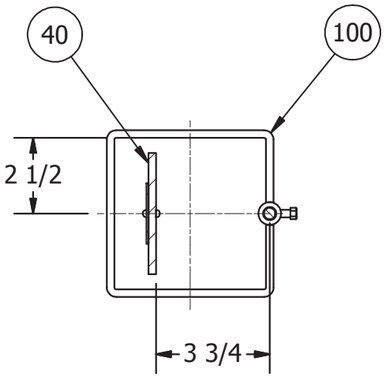
Project		
Engineering Item	**1001019**	**Gauge,Headloss,48,DB,316**
Engineering Item Revision	**2**	**Item 50 was 0001091**
Revision Status	**Approved by Production**	
Drawing	**1001019.dwg**	
BOM Quantity	**1**	**ea**

100	1002624 Indicator,Headloss,316	1	001120-01.dwg		316	M		1.0000	ea





VIEW A-A



SECTION B-B

NOTES:

1.WEIGHT: 36.5 lbs

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
100	1	1002624	Indicator,Headloss	316
90	2	0000754	Washer,Lock,1/4	316
80	2	0000658	Nut,Hex,1/4-20	316
70	1	0000911	Eyebolt,1/4-20x4,1/2 Eye,McMASTER CARR# 3032T57	316
60	1	0000189	Ruler,48,Johnson #J48	Alum
50	3	0009718	Rivet,Pop,Klik-Fast,3/16 Buttonhead Rivet,SSB-6S	SS
40	1	1003363	Bracket,Support,Headloss Gauge	316
30	1	0001136	Float,8x3/8 NPT, McMaster CArr, 9775K18	Polyprop
20	1	0000029	Plug,Pipe,3/8NPT-150#	316
10	1	0001007	Bar,Round,3/8, 132" Lg	316

PART LIST

REV	DESCRIPTION	DATE	BY	ECO	CHK

REVISION SCHEDULE

PARKSON CORPORATION

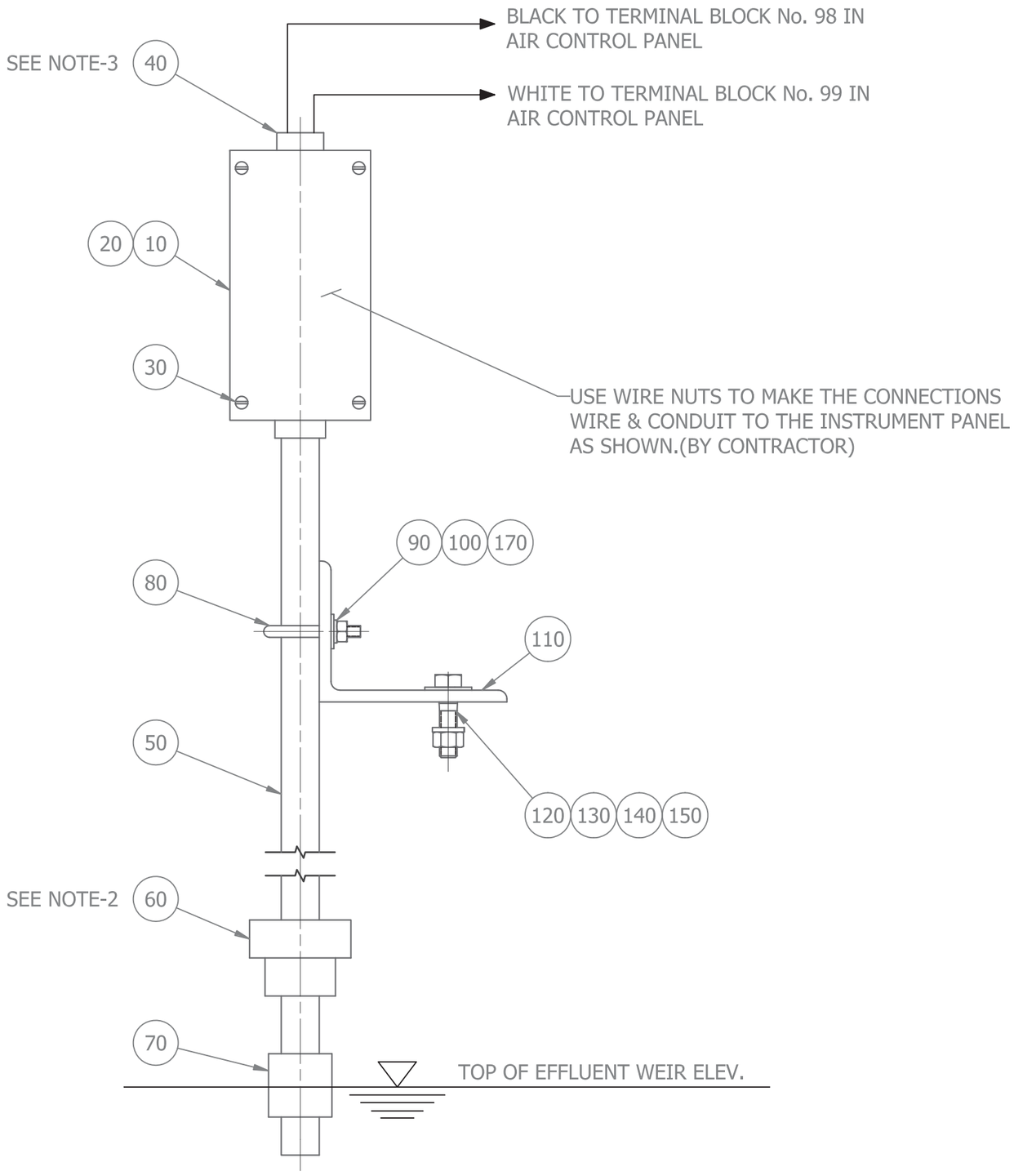
TOLERANCES Except where noted		DRAWN BY	DATE	TITLE
3-FIG DEC	`.030	chinmayv	5/30/2007	GAUGE, HEADLOSS, 48", DB
2-FIG DEC	`.06	CHECKED BY	DATE	
ANGULAR	`1/2~	F.J.C	5/30/2007	
MAX EDGE RAD	.13	SCALE	WEIGHT	
WELD SIZE	1/8	NTS		
MACHINED SURFACES NOT TO EXCEED	150	ER:		DRAWING NO: 1001019-01 SHEET 1 OF 1 — REV 0

Material List

Date 09-26-2018 07:47					Mat'l List	Page 1		
Production						Company 100		
					Project : Sandard Part			
					E-Item : 1001201 - Switch Assy,Low Level,316			
					E-Item Revision: 4 added weight to drw			
					Drawing/Spec Reference: 1001201A.dwg			
Pos.	Item	Rev.	Drawing/Spec	Dwg Size	Description	Mat'l	Net Quantity	Unit
10	0000195	0			Box,Device,(2)1/2 Outlets	Alum	1	ea
					Crouse Hines #FDC1SA,ALUM.			
20	0000196	0			Cover,Blank,W/Gasket,Alum	Alum	1	ea
					Graybar 36, Model DS100G			
					For Junction Box FDC1			
30	0001478	0			Screw,Pan Head,#6-32x3/4,316	316	4	ea
40	0001064	0			Plug,Plastic,Niagra,#203	Plastic	1	ea
					Alt. McMaster Carr 4491K2, pkg of			
					100			
50	0000638	0			Pipe,1/2,Sch40,316	316	20	in
					Thrd Both Ends 1/2 NPT			
60	0001665	0			Coupling,Red,1/2x1/4 NPT,316	316	1	ea
70	0000193	0			Switch,Level,Gems	316	1	ea
					Series ALS 1900,#A01907			
80	0001484	0			U-Bolt,1/2 Pipe,1/4-20,316	316	1	ea
90	0000754	0			Washer,Lock,1/4,316	316	2	ea
100	0000687	0			Washer,Flat,1/4,316	316	2	ea
					316SS			
					ALT - 3024-002/6			
110	1002623	1	001111-01.dwg		Bracket,Mount,Level,Switch,316	316	1	ea
120	0000117	0			Bolt,Hex,3/8-16x1 1/2,316	316	1	ea
130	0000662	0			Nut,Hex,3/8-16,316	316	1	ea

Material List

Date 09-26-2018 07:47					Mat'l List	Page 2			
Production						Company 100			
E-Item : 1001201					Switch Assy,Low Level,316 Mak				
Pos.	Item	Rev.	Drawing/Spec	Dwg Size	Description		Mat'l	Net Quantity	Unit
140	0000690	0			Washer,Flat,3/8,316		316	1	ea
					ALT - 3024-116/6				
150	0000759	0			Washer,Lock,3/8,316		316	1	ea
					ALT - 3025-004/6				
160	0001489	0			Sealant,RTV108,10.3oz,		Silicone	1	ea
					Cartridge,Silicone,Rubber				
					#63056				
					McMaster# 7545A472				
					Use 1 Tube Per 10 Assy's				
170	0000658	0			Nut,Hex,1/4-20,316		316	2	ea



CONTRACTOR NOTE:

1. USE FLEXIBLE CONDUIT TO ALLOW FOR VERTICAL ADJUSTMENT.

SHOP NOTES:

1. USE PLUMBING TAPE & MAKE ALL JOINTS WATERTIGHT.
2. SILICONE SEALING-THREAD ITEM #70 INTO ITEM #60 BEFORE THREADING ITEM #50 INTO ITEM-60 FILL ITEM-60 WITH SILICONE.
3. INSTALL ITEM-40 IN OPEN END OF BOX BEFORE SHIPPING.
4. USE ONE TUBE ITEM #160 PER (10) LEVEL SWITCHES.

REV	DESCRIPTION	DATE	BY	ECO	CHK
A	ADDED WEIGHT TO TITLEBLOCK, REMOVED BOM	RJP	9/9/15	007143	FJC

REVISION SCHEDULE

PARKSON CORPORATION

TOLERANCES Except where noted		DRAWN BY	DATE	TITLE
3-FIG DEC	`.030	chinmayv	5/31/2007	SWITCH ASSEMBLY, LOW LEVEL
2-FIG DEC	`.06	CHECKED BY	DATE	
ANGULAR	`1/2~	F.J.C	7/18/2007	
MAX EDGE RAD	.13	SCALE	WEIGHT	
WELD SIZE	1/8	NTS	3.87 lbs	
MACHINED SURFACES NOT TO EXCEED	150	ER:		DRAWING NO: 1001201 SHEET 1 OF 1 REV A

Large Size – Alloys

LS-1800 and LS-1900 Series are a Step Above Our Plastic Units for Pressure Capabilities

Excellent stability for general use in oils and water.

LS-1800 Series – Buna N Float

LS-1800 Series – Teflon® Float

LS-1900 Series – Buna N Float

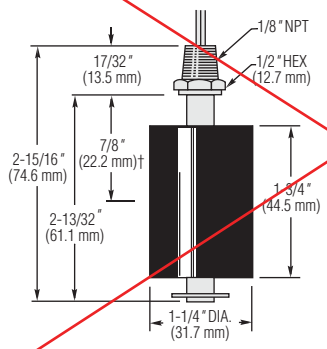
Intermediate in size, LS-1800 switches provide long life and dependability to meet a broad range of requirements.

With large float displacement, switch withstands rough service; is suitable for high viscosity liquids.

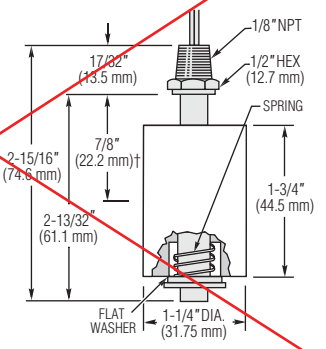
Dimensions

LS-1800 Series

Buna N Float

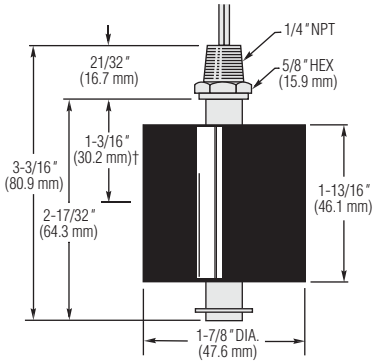


Teflon® Float



LS-1900 Series

Buna N Float



†L_1 = Switch actuation level, nominal (based on a liquid specific gravity of 1.0).

Common Specifications

Electrical Termination: No.18 AWG, 24˝ L., Polymeric Lead Wires.

Approvals: All Switches on this page are U.L. Recognized – File No. E45168, and are CSA Listed – File No. 30200.

Switch Operation: Selectable, N.O. or N.C., by inverting float on unit stem (except for LS-1800 Series switch with Teflon® float). Units are shipped N.O. unless otherwise specified.

How To Order – Select Part Number based on specifications required.

Series Number	Material: Stem and Mounting	Material: Float	Material: Other Wetted	Min. Liquid Sp. Gr.	Operating Temperature	Pressure, PSI, Max.	Switch* SPST	Part Number
LS-1800	Brass	Buna N	316 Stainless Steel, Hysol	.75	Water: to 180°F (82.2°C) Oil: -40°F to +230°F (-40°C to +110°C)	150	20 VA	**01801**
							100 VA**	**35651**
	316 Stainless Steel	Buna N		.75			20 VA	**01807**
							100 VA**	**35657**
		Teflon®		.65	-40°F to +250°F (-40°C to +121.1°C)	300	20 VA, N.O.	**01811**
LS-1900	Brass	Buna N	316 Stainless Steel, Hysol	.55	Water: to 180°F (82.2°C) Oil: -40°F to +230°F (-40°C to +110°C)	150	20 VA	**01901**
							100 VA***	**35676**
	316 Stainless Steel			.55			20 VA	**01907**
							100 VA	**35682**

**See "Electrical Data" on Page X-5 for more information.
**LS-1800 100 VA switches are not U.L. Recognized.

*** LS-1900 100VA unit is UL Resistive Rated.

Section II – CONTROL PANEL

	--------	**Dynasand Air Control Logic**
1011245-01	**Rev. 8**	**Dynasand Filter Air Control Panel Two 50 SQ. Ft Modules, FRP Enclosure Panel Layout & BOM**
1011245-02	**Rev. 8**	**Dynasand Filter Air Control Panel Two 50 SQ. Ft Modules, FRP Enclosure Electrical & Pneumatic Diagrams**
1012245	--------	**Dynasand Air Control Panel Cut Sheets**

PARKSON CORPORATION

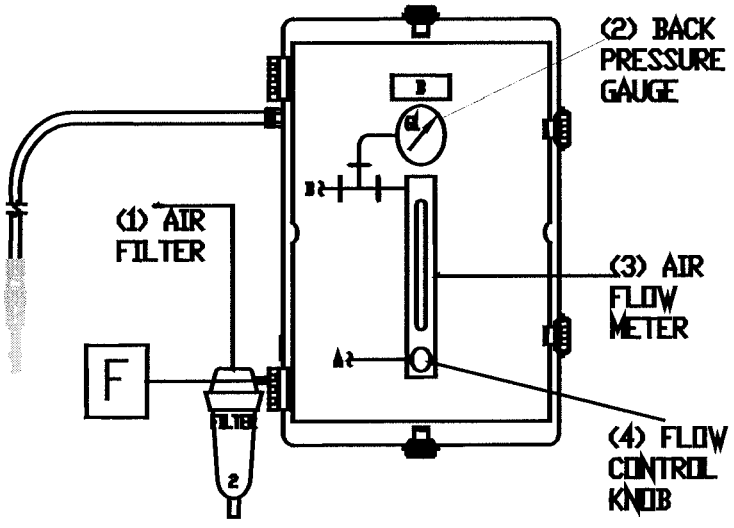
DynaSand® Filter Control Logic

Air Control Panel

The air control panel permits the user to operate the DynaSand Filter within its design parameters.

Air is introduced into the air pressure regulator (ITEM 7 ON NEXT PAGE). The pressure is adjusted to 25 - 35 PSI. The air passes through the regulator and is fed to the flow meter (3) via the polyethylene tubing. To supply air to the airlift, the operator can adjust the flow rate of air by turning the knob (4) on the flow meter. The parameters for each application are outlined in the "Operation" section of O & M manual.

CONTROL PANEL



Backpressure Gauge (4)

This shows (2) the backpressure being produced by the airflow through the airlift and associated tubing. It should normally read below 20 psi.

2727 N.W. 62ND STREET
FORT LAUDERDALE FL, 33309-1771

29850 N. SKOKIE HIGHWAY
LAKE BLUFF, IL 60044-1192

MAILING ADDRESS:
P.O. BOX 408399
FORT LAUDERDALE, FL 33340-8399

TELEPHONE
954 974-6610

847-473-3100

FAX
954 974-6182

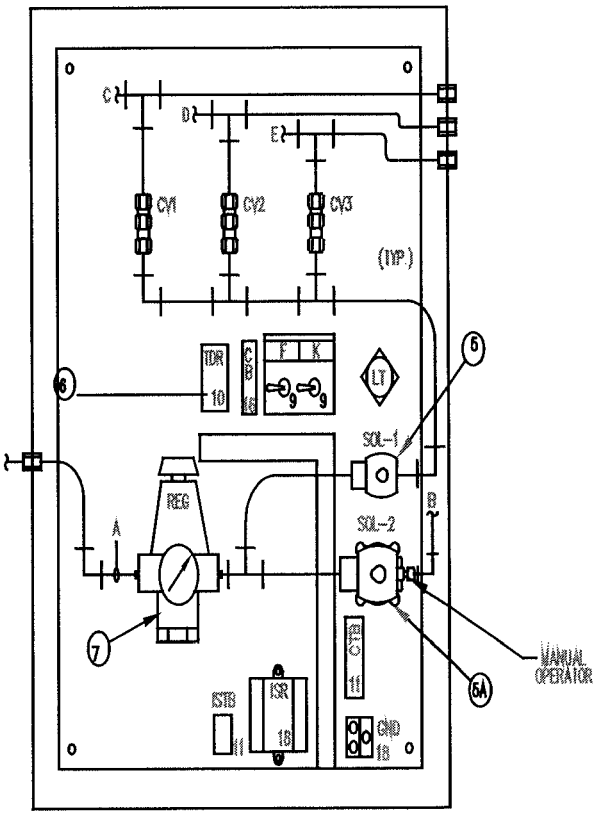
847-473-0477

AN AXEL JOHNSON INC. COMPANY

PARKSON CORPORATION

Solenoid Valves (3 to 5)

This solenoid valve (5 and 5A) is associated with an "air-burst" feature that also includes a timer (6). The "air-burst" feature provides a timed burst of high-pressure air to the airlift whenever it is started up. This burst of air ensures that the airlift starts to pump sand before dropping back to the normal operating air supply through the solenoid. When the float on the level switch stem rises, the timer cycle begins and the solenoid valve (5A) opens. At the end of the timed cycle, the valve (5A) closes and solenoid (5) remains open.



INTERIOR VIEW BEHIND SWING-OUT PANEL

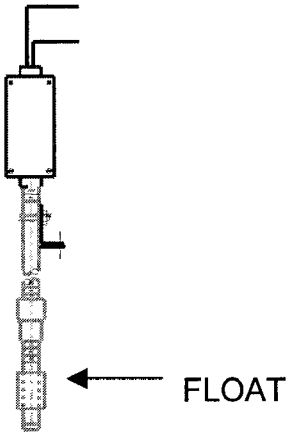
Timer

The timer (6) is provided for the "air-burst" solenoid valve described above. It should normally be set to 3 - 5 seconds.

PARKSON CORPORATION

Level Switch

This is provided for automatic control of the air supply to the airlift. It is controlled by the level switch that registers the water level in the top of the filter. When water is flowing through the filter, the water rises to the level of the effluent weir. This closes the level switch which opens the solenoid (5) and (5A) valves and allows air to flow to the airlift. When water flow stops, the water drops to the level of the reject weir and the level switch makes the solenoid valve close and the air flow to the airlift is stopped. This system is provided so that the airlift will not continue to bring up dirty sand to the top of the filter when there is no water available to provide reject flow.



2727 N.W. 62ND STREET
FORT LAUDERDALE FL, 33309-1771

29850 N. SKOKIE HIGHWAY
LAKE BLUFF, IL 60044-1192

MAILING ADDRESS:
P.O. BOX 408399
FORT LAUDERDALE, FL 33340-8399

TELEPHONE
954 974-6610

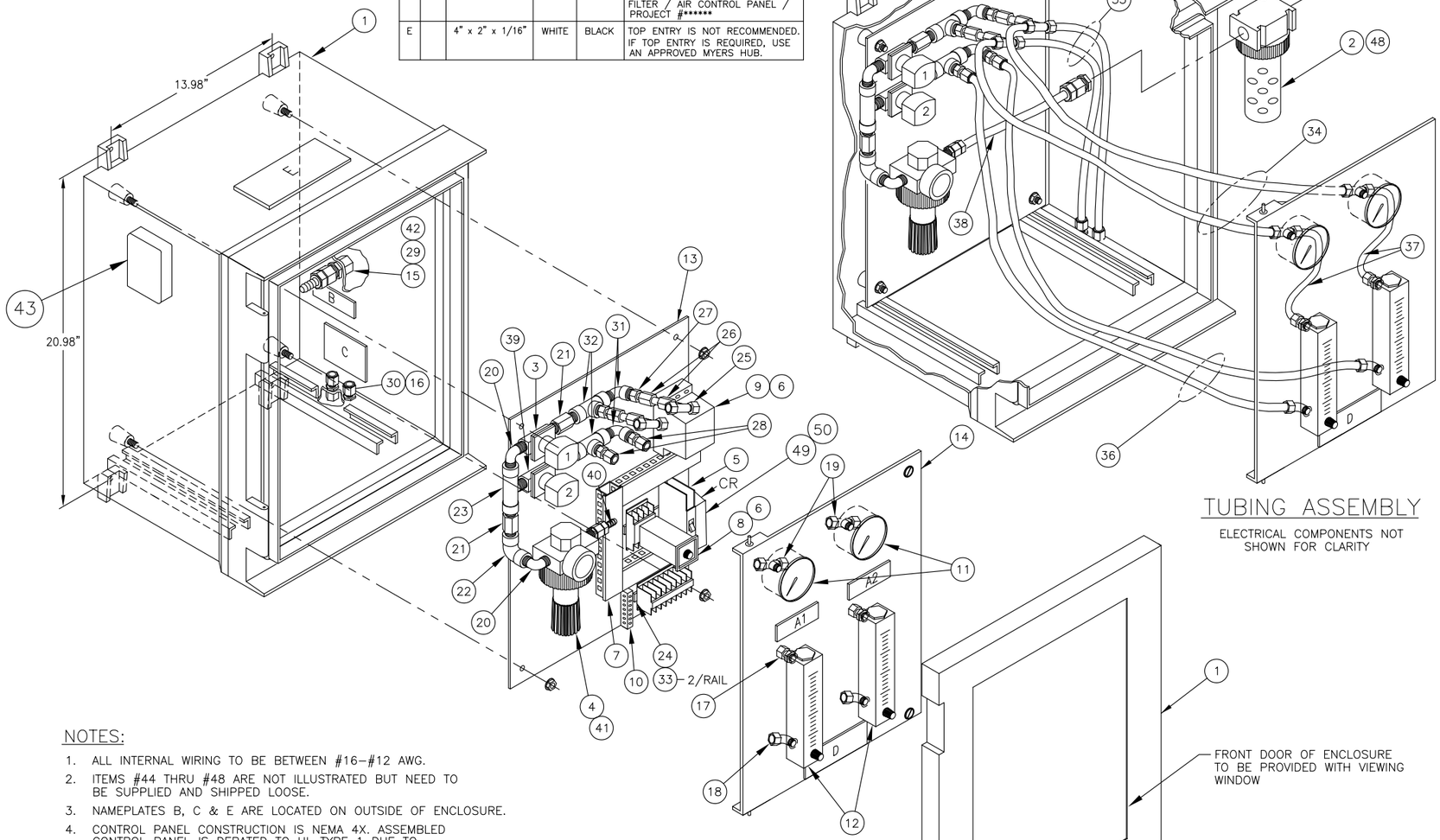
847-473-3100

FAX
954 974-6182

847-473-0477

AN AXEL JOHNSON INC.
COMPANY

ENGRAVING SCHEDULE					
I.D. No.		SIZE	PLATE COLOR	LETTER COLOR	FIRST LINE / SECOND LINE, ETC.
A		1" x 3.5" x 1/16"	WHITE	BLACK	UNIT ONE / FLOW & PRESSURE UNIT TWO / FLOW & PRESSURE
B		1" x 3" x 1/16"	WHITE	BLACK	AIR SUPPLY
C		3.5" x 2.25" x 1/16"	WHITE	BLACK	TO AIRLIFT / UNIT ONE TO AIRLIFT / UNIT TWO
D		6" x 2.5" x 1/16"	BLUE	WHITE	(PARKSON LOGO) / DynaSand® FILTER / AIR CONTROL PANEL / PROJECT #******
E		4" x 2" x 1/16"	WHITE	BLACK	TOP ENTRY IS NOT RECOMMENDED. IF TOP ENTRY IS REQUIRED, USE AN APPROVED MYERS HUB.



EXPLODED ASSEMBLY

TUBING NOT SHOWN FOR CLARITY

TUBING ASSEMBLY

ELECTRICAL COMPONENTS NOT SHOWN FOR CLARITY

NOTES:

1. ALL INTERNAL WIRING TO BE BETWEEN #16–#12 AWG.
2. ITEMS #44 THRU #48 ARE NOT ILLUSTRATED BUT NEED TO BE SUPPLIED AND SHIPPED LOOSE.
3. NAMEPLATES B, C & E ARE LOCATED ON OUTSIDE OF ENCLOSURE.
4. CONTROL PANEL CONSTRUCTION IS NEMA 4X. ASSEMBLED CONTROL PANEL IS DERATED TO UL TYPE 1 DUE TO BULKHEADS NOT BEING EVALUATED BY UL.
5. OTHERS TO SUPPLY SHUTOFF VALVE AHEAD OF FILTER.
6. ESTIMATED WEIGHT IS 55 LBS.
7. ASSEMBLED CONTROL PANEL TO HAVE UL508A LABEL.
8. SEE DRAWING 1011245–02_7 FOR LABEL SCHEDULE

Item	Qty.	Description	Reference	Mat'l	Remarks
50	1	RELAY MOUNTING SOCKET	SH1B–05		IDEC
49	1	RELAY, 1PDT, 120VAC COIL	RH1B–ULAC120		IDEC
48	1	REDUCING NIPPLE 3/8"x1/4"	SS–6–HRN–4	316SS	CAJON
47	1	HOSE, FLEX, 1/4" I.D. x 40' LONG	3384–04398	250 PSI	HBD/THERMOID
46	4	MALE HOSE CONNECTOR, 1/4" x 1/4"	SS–4–HC–1–4	316 SS	CAJON
45	2	QUICK CONNECT STEM, 1/4" FEMALE	SS–QF4–S–4PF	316 SS	SWAGELOK
44	2	QUICK CONNECT BODY, 1/4" FEMALE	SS–QF4–B–4PF	316 SS	SWAGELOK
43	1	BREATHER VENT	BV4XKIT		STAHLIN
42	1	TUBE ADAPTER, 3/8" x 1/2"	SS–6–HC–A–811	316 SS	SWAGELOK
41	1	REGULATOR MTG. BRACKET & GAGE	P781641/PS707P		PARKER
40	1	BARBED HOSE CONNECTOR 3/8"x3/8"	B–6–HC–1–6	BRASS	CAJON
39	1	VALVE, SOLENOID W/MAN. OPER.	#8210–G73MOMB		ASCO
38	1	HOSE, 3/8" I.D. x 12" LG.	PB–6	100–150 PSI	SWAGELOK
37	2	TUBING, 3/8" O.D.	6" LG.	10–30 PSI	POLY FLO
36	2	TUBING, 3/8" O.D.	2'–6" LG.	10–30 PSI	POLY FLO
35	2	TUBING, 3/8" O.D.	1'–6" LG.	POLY FLO	10–30 PSI
34	2	TUBING, 3/8" O.D.	1'–0" LG.	POLY FLO	10–30 PSI
33	11	TERMINAL BLOCK, #24–#8 AWG	1020100000		WEIDMULLER
32	2	TEE, 3/8"	B–6–T	BRASS	CAJON
31	2	STREET ELBOW, 3/8"	B–6–SE	BRASS	CAJON
30	2	BULKHEAD FEMALE CONN., 3/8" x 1/4"	SS–600–71–4	316 SS	SWAGELOK
29	1	BULKHEAD FEMALE CONN., 1/2" x 3/8"	SS–810–71–6	316 SS	SWAGELOK
28	2	MALE CONNECTOR, 3/8" x 3/8"	B–600–1–6	BRASS	SWAGELOK
27	2	HEX RED. NIPPLE, 3/8" x 1/4"	B–6–HRN–4	BRASS	CAJON
26	2	CHECK VALVE, 1/4" NPT	B–4CP2–1	BRASS	SWAGELOK
25	2	MALE BRACH TEE, 3/8" x 1/4"	B–600–3TTM	BRASS	SWAGELOK
24	1LF	DIN RAIL	TS35		ANY
23	1	BRANCH TEE, 3/8"	B–6–BT	BRASS	CAJON
22	1	ELBOW, 3/8"	B–6–E	BRASS	CAJON
21	3	HEX LONG NIPPLE, 3/8"	B–6–HLN–2.00	BRASS	CAJON
20	2	MALE ELBOW, 3/8"	B–6–ME	BRASS	CAJON
19	2	FEMALE BRANCH TEE, 3/8" x 1/4"	B–600–3TTF	BRASS	SWAGELOK
18	2	MALE ELBOW, 3/8" x 1/8"	B–600–2–2	BRASS	SWAGELOK
17	2	MALE CONNECTOR, 3/8" x 1/8"	B–600–1–2	BRASS	SWAGELOK
16	2	GASKET, WASHER	FOR 1/4" NPT		
15	1	GASKET, WASHER	FOR 1/2" NPT		
14	1	PANEL, SWING OUT W/HARD.	UU5040SP		HOFFMAN
13	1	PANEL – INNER	A–20P16AL	ALUM.	HOFFMAN
12	2	ROTAMETER, MODIFIED VFB–55–SSV	55–168338–00		DWYER
11	2	PRESSURE GAUGE, 0–60PSI, 2–1/2"	9767202/UC		WIKA
10	1	GROUNDING BAR	PK5GTA		SQUARE D
9	1	LEVEL RELAY – SOLID STATE	PNR–110A		SYRELEC
8	1	RELAY, 0–10 SEC.	RTE–P1AF20		IDEC
7	1LF	WIRE DUCT, 1" x 1"	TYPE F		PANDUIT
6	2	SOCKET FOR TIMER	SR2P–06		IDEC
5	1	CIRCUIT BREAKER, 10 AMP–1 POLE	Q0U110		SQUARE D
4	1	REGULATOR, 3/8" NPT	06R213AC		PARKER
3	1	VALVE, SOLENOID, 3/8" NPT	8210–G73MB		ASCO
2	1	FILTER W/MTL. BOWL, 1/4" NPT	06F14AC		PARKER
1	1	ENCLOSURE, ULTRX TYPE 4X	U–U504030W	FRP	HOFFMAN

SEE NOTE #2

REV	DESCRIPTION	DATE	BY
8	REVISED ITEMS #2, #4	06/07/22	CAM
7	REVISED ITEM #26	02/25/22	CAM
6	UPDATED ENGRAVING SCHEDULE	10/25/16	TRB
E	ADDED ITEM #43 & NAMEPLATE "D" REVISED ITEM 47	7–18–12	TRB
D	PUT ON NEW TITLE BLOCK	07–08–08	TRB

__PRELIMINARY __APPROVAL

__INFORMATION __CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

DRAWN BY	MLB
DATE	08–09–04
CHECKED BY	TRB
DATE	08–09–04
SCALE	1/8"=1"
SIZE	B

Parkson™

PROJECT NAME: P01501867 JEFFERSON, GA

REFERENCE INFORMATION: 1011245701

RCS #: AC0460

TITLE: DYNASAND® FILTER AIR CONTROL PANEL
TWO 50 SQ FT MODULES – FRP ENCLOSURE
PANEL LAYOUT AND BILL OF MATERIAL

DRAWING NO: 1011245–01

SHEET 1 OF 2

REV: 8

LEGEND:

- DENOTES STAINLESS STEEL PIPE NIPPLE
- DENOTES BRASS PIPE
- DENOTES 3/8" TUBING, POLYFLO TYPE
- DENOTES A CHECK VALVE
- DENOTES A TERMINAL BLOCK POINT
- * DENOTES ITEM REMOTE FROM CONTROL PANEL
- DENOTES WIRING REMOTE FROM CONTROL PANEL
- DENOTES WIRING INSIDE CONTROL PANEL

NOTE: LEVEL SWITCH WIRING SHOULD BE SEPARATED FROM ALL OTHER WIRING BY A MINIMUM OF 2".

FOR ALL ITEMS LISTED SEE BILL OF MATERIAL DRAWING NUMBER 1011245-01

LABEL SCHEDULE

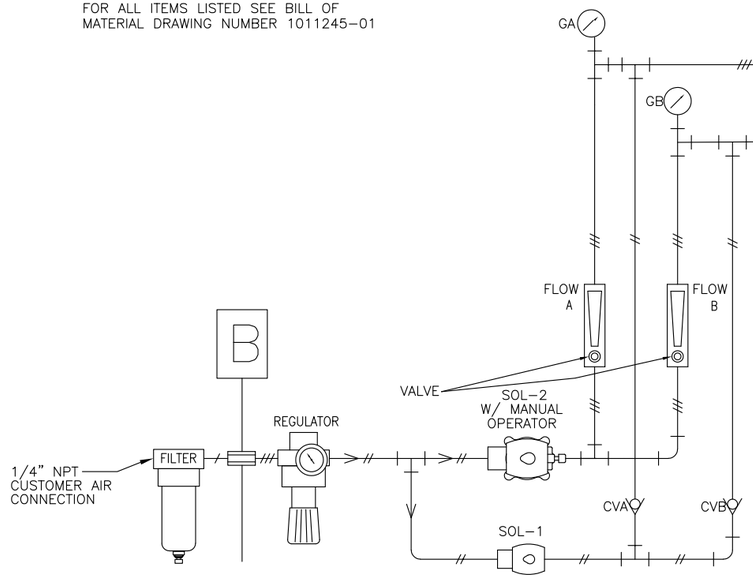
LBL-1 RCS INFORMATION LABEL:
SERIAL NO. AC0460 CUSTOMER ID: P01501867
LINE VOLTAGE _____, ___PHASE, __ WIRE, 60 Hz.
CONTROL VOLTAGE 120V ___LARGEST MOTOR HP _____ TOTAL FLA 2
RCS CONTACT C. MCMICKEN
REF. DWG. NO. 1011245R8 TYPE NEMA 4X/ UL TYPE 1 ENCLOSURE
SHORT CIRCUIT CURRENT RATING 10K RMS SYMMETRICAL AMPERES

LBL-2 TO MAINTAIN ENCLOSURE RATING, USE HUBS OR FITTINGS WITH THE SAME ENVIRONMENTAL RATING AS THE ENCLOSURE.
O-Z/GEDNEY CHMG SERIES GROUNDING STYLE HUBS
APPLETON HUBG SERIES GROUNDING STYLE HUBS
CROUSE HINDS STG SERIES GROUNDING STYLE HUBS

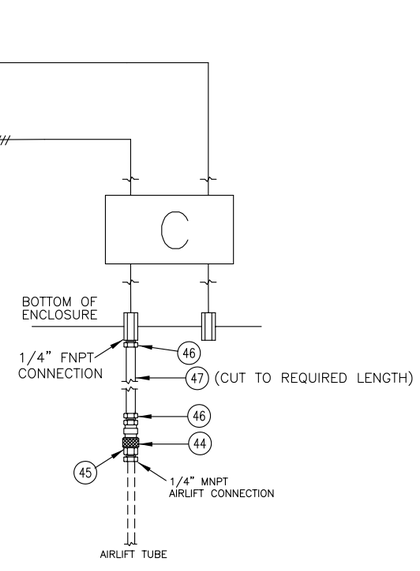
CAUTION: BONDING TO CONDUIT CONNECTION IS NOT AUTOMATIC AND MUST BE PROVIDED AS PART OF THE INSTALLATION.

LBL-3 UL508A SERIALIZED LABEL

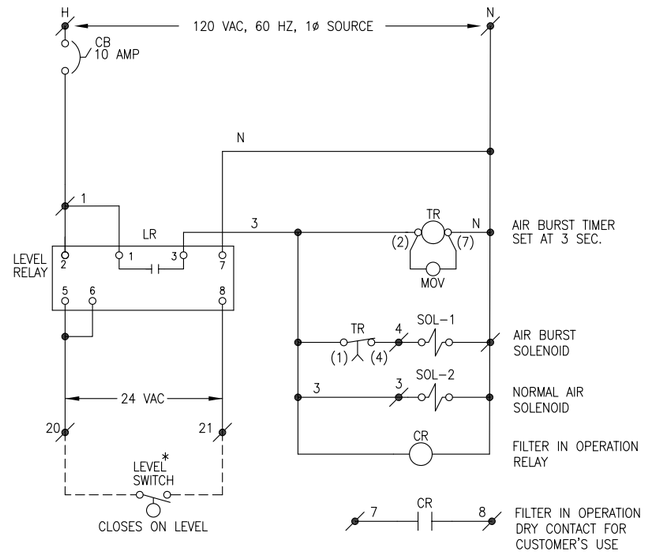
LBL-4 USE COPPER CONDUCTORS ONLY.
RECOMMENDED TORQUE: 9 LB. INS.



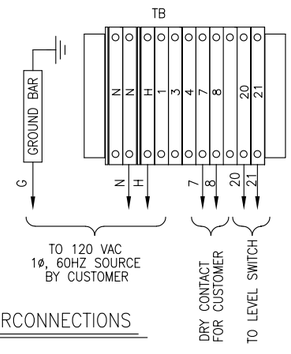
PNEUMATIC DIAGRAM



FIELD TUBING DETAIL



ELECTRICAL DIAGRAM



FIELD INTERCONNECTIONS

REV	DESCRIPTION	DATE	BY
8	REVISED ITEMS #2, #4	06/07/22	CAM
7	REVISED ITEM #26	02/25/22	CAM
6	UPDATED ENGRAVING SCHEDULE	10/25/16	TRB
E	ADDED ITEM #43 & NAMEPLATE "D" REVISED ITEM 47	7-18-12	TRB
D	PUT ON NEW TITLE BLOCK	07-08-08	TRB

___PRELIMINARY ___APPROVAL
___INFORMATION ___CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

DRAWN BY	DATE
MLB	08-09-04
CHECKED BY	DATE
TRB	08-09-04
SCALE	SIZE
1/8"=1"	B

Parkson™

PROJECT NAME
P01501867
JEFFERSON, GA

TITLE
DYNASAND® FILTER AIR CONTROL PANEL
TWO 50 SQ FT MODULES – FRP ENCLOSURE
ELECTRICAL AND PNEUMATIC DIAGRAMS

REFERENCE INFORMATION
1011245702
RCS #: AC0460

DRAWING NO
1011245-02
SHEET 2 OF 2

REV
8

ULTRX® Type 4X Fiberglass Enclosures

Item 1

Application

This stylized world-class enclosure is a highly effective corrosion-resistant housing for electrical and electronic controls. It provides outstanding protection against atmospheric and marine corrosion in indoor or outdoor settings, including petrochemical plants, water treatment facilities, pulp and paper processing, and electroplating plants. A window cover enclosure is also available, providing easy visual inspection of interior components.

Construction

- Molded fiberglass-reinforced material has excellent temperature and chemical resistance qualities and exhibits outstanding physical properties, including high-impact resistance
- Fiberglass is easily punched, drilled, filed, or sawed
- Seamless foam-in-place gasket assures watertight and dust-tight seal
- Enclosure may be rotated 180 degrees for left and right hinging
- Molded-in drip shields are standard with each enclosure
- Impact-resistant polycarbonate window is permanently bonded in place
- Fiberglass mounting brackets and stainless steel attachment screws are provided with each enclosure
- Unique hinge design allows for standard 180 degree door opening with a maximum opening of 270 degrees
- Door hinges are replaceable
- Patented Type 316 stainless steel quarter-turn latch. Optional keylocking or padlocking handle available
- Molded-in DIN bosses
- Molded bosses on door provide additional mounting provisions
- Integral mounting rails provide infinite panel adjustment front to back
- Optional data pocket is high-impact thermoplastic

Finish

Exterior surface painted light gray acrylic enamel for enhanced UV protection. Optional steel panels are painted white. Optional stainless steel, aluminum, conductive, and composite panels are unpainted.

Industry Standards

UL 508A, File No. E61997: Type 3, 3R, 4, 4X, 12, and 13
NEMA/EEMAC Type 3, 3R, 4, 4X, 12, and 13
Enclosure flammability rating per UL 508A
CSA File No. 42186: Type 3, 3R, 4, 4X, 12, and 13
IEC 60529, IP66
Meets Type 3RX requirements

Patents

This product is covered by the following patent:
US 5,481,889

Accessories

Data Pocket
DIN Type Rails
Electric Heaters
Lighting Packages
Panels
Rack Angles
Terminal Block Kit Assemblies
Touch-Up Paint (ATPFG)
Window Kits
Wiring Duct
ULTRX Accessories

Modification Services Program

You can customize this product to your unique requirements by specifying from these options:

- Colors
- Subpanels
- Holes and cutouts in body, doors, subpanels
- Environmental control (louvers, fans, filters)
- Standard accessories

To order, contact your local Hoffman sales representative.

NOTE: For information about modifications outside the scope of the Modification Services program, contact your Hoffman sales representative.

Standard Sizes ULTRX Type 4X Fiberglass Enclosures

Catalog Number[a]	External Dimensions L x W mm (in.)	Internal Dimensions A x B x C mm (in.)	Panel Catalog Number	Conductive Panel Catalog Number	Panel Size D x E mm (in.)	Mounting G x H mm (in.)	Window Size M x N mm (in.)	F mm (in.)	J mm (in.)	K mm (in.)	P mm (in.)	Q mm (in.)	R mm (in.)	S mm (in.)	T mm (in.)
UU504020	513 x 413 (20.20 x 16.26)	496 x 396 x 220 (19.53 x 15.59 x 8.66)	**A20P16**	**A20P16G**	432 x 330 (17.00 x 12.99)	359 x 459 (14.13 x 18.07)	—	186 (7.32)	297 (11.69)	19 (0.75)	64 (2.52)	63 (2.48)	58 (2.28)	286 (11.26)	387 (15.24)
UU504020W	513 x 413 (20.20 x 16.26)	496 x 396 x 220 (19.53 x 15.59 x 8.66)	**A20P16**	**A20P16G**	439 x 330 (17.00 x 12.99)	359 x 459 (14.13 x 18.07)	386 x 286 (15.20 x 11.26)	186 (7.32)	297 (11.69)	19 (0.75)	64 (2.52)	63 (2.48)	58 (2.28)	286 (11.26)	387 (15.24)
UU606020	625 x 612 (24.61 x 24.09)	608 x 595 x 220 (23.94 x 23.43 x 8.66)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	559 x 572 (22.01 x 22.52)	—	186 (7.32)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU606020W	625 x 612 (24.61 x 24.09)	608 x 595 x 220 (23.94 x 23.43 x 8.66)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	559 x 572 (22.01 x 22.52)	498 x 486 (19.61 x 19.13)	186 (7.32)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU605025	625 x 513 (24.61 x 20.20)	608 x 496 x 270 (23.94 x 19.53 x 10.63)	**A24P20**	**A24P20G**	533 x 432 (20.98 x 17.00)	457 x 570 (17.99 x 22.44)	—	239 (9.41)	400 (15.75)	21 (0.83)	63 (2.48)	68 (2.68)	56 (2.20)	387 (15.24)	489 (19.25)
UU605025W	625 x 513 (24.61 x 20.20)	608 x 496 x 270 (23.94 x 19.53 x 10.63)	**A24P20**	**A24P20G**	533 x 432 (20.98 x 17.00)	457 x 570 (17.99 x 22.44)	498 x 386 (19.61 x 15.20)	239 (9.41)	400 (15.75)	21 (0.83)	63 (2.48)	68 (2.68)	56 (2.20)	387 (15.24)	489 (19.25)

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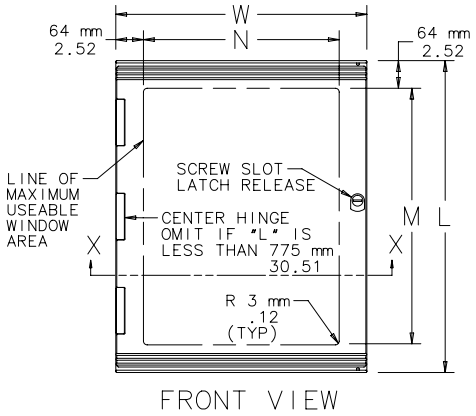
ULTRX® Type 4X Fiberglass Enclosures

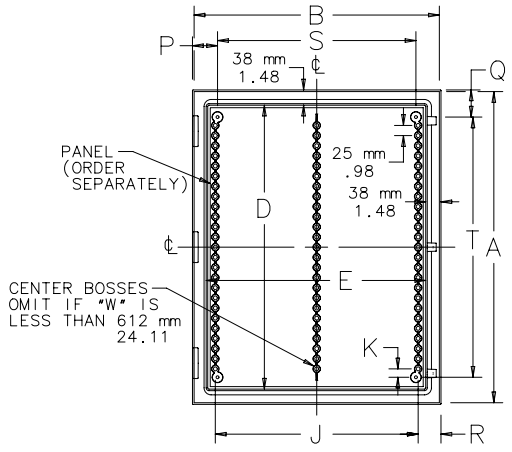
Standard Sizes ULTRX Type 4X Fiberglass Enclosures (Cont.)

Catalog Number[a]	External Dimensions L x W mm (in.)	Internal Dimensions A x B x C mm (in.)	Panel Catalog Number	Conduc-tive Panel Catalog Number	Panel Size D x E mm (in.)	Mounting G x H mm (in.)	Window Size M x N mm (in.)	F mm (in.)	J mm (in.)	K mm (in.)	P mm (in.)	Q mm (in.)	R mm (in.)	S mm (in.)	T mm (in.)
UU504030	513 x 412 (20.20 x 16.22)	496 x 395 x 321 (19.53 x 15.55 x 12.64)	**A20P16**	**A20P16G**	432 x 330 (17.00 x 12.99)	355 x 455 (13.98 x 17.91)	—	287 (11.30)	300 (11.81)	19 (0.75)	64 (2.52)	63 (2.48)	56 (2.20)	286 (11.26)	387 (15.24)
UU504030W	513 x 412 (20.20 x 16.22)	496 x 395 x 321 (19.53 x 15.55 x 12.64)	**A20P16**	**A20P16G**	432 x 330 (17.00 x 12.99)	355 x 455 (13.98 x 17.91)	386 x 286 (15.20 x 11.26)	287 (11.30)	300 (11.81)	19 (0.75)	64 (2.52)	63 (2.48)	56 (2.20)	286 (11.26)	387 (15.24)
UU606030	625 x 612 (24.61 x 24.09)	608 x 595 x 321 (23.94 x 23.43 x 12.64)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	555 x 568 (21.85 x 22.36)	—	287 (11.30)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU606030W	625 x 612 (24.61 x 24.09)	608 x 595 x 321 (23.94 x 23.43 x 12.64)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	555 x 568 (21.85 x 22.36)	498 x 486 (19.61 x 19.13)	287 (11.30)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU756030	775 x 612 (30.51 x 24.09)	758 x 595 x 321 (29.84 x 23.43 x 12.64)	**A30P24**	**A30P24G**	686 x 533 (27.01 x 20.98)	555 x 718 (21.85 x 28.27)	—	287 (11.30)	500 (19.68)	21 (0.83)	62 (2.44)	67 (2.64)	56 (2.20)	489 (19.25)	641 (25.24)
UU756030W	775 x 612 (30.51 x 24.09)	758 x 595 x 321 (29.84 x 23.43 x 12.64)	**A30P24**	**A30P24G**	686 x 533 (27.01 x 20.98)	555 x 718 (21.85 x 28.27)	648 x 486 (25.51 x 19.13)	287 (11.30)	500 (19.68)	21 (0.83)	62 (2.44)	67 (2.64)	56 (2.20)	489 (19.25)	641 (25.24)
UU1008030	1025 x 825 (40.35 x 32.48)	1008 x 808 x 321 (39.68 x 31.81 x 12.64)	**A40P30**	**A40P30G**	940 x 737 (37.01 x 29.02)	768 x 968 (30.24 x 38.11)	—	287 (11.30)	700 (27.56)	23 (0.91)	67 (2.64)	65 (2.56)	62 (2.44)	692 (27.24)	895 (35.24)
UU1008030W	1025 x 825 (40.35 x 32.48)	1008 x 808 x 321 (39.68 x 31.81 x 12.64)	**A40P30**	**A40P30G**	940 x 737 (37.01 x 29.02)	768 x 968 (30.24 x 38.11)	898 x 698 (35.35 x 27.48)	287 (11.30)	700 (27.56)	23 (0.91)	67 (2.64)	65 (2.56)	62 (2.44)	692 (27.24)	895 (35.24)
UU606040	625 x 612 (24.61 x 24.09)	608 x 595 x 421 (23.94 x 23.43 x 16.57)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	555 x 568 (21.85 x 22.36)	—	387 (15.24)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU606040W	625 x 612 (24.61 x 24.09)	608 x 595 x 421 (23.94 x 23.43 x 16.57)	**A24P24**	**A24P24G**	533 x 533 (20.98 x 20.98)	555 x 568 (21.85 x 22.36)	498 x 486 (19.61 x 19.13)	387 (15.24)	500 (19.68)	21 (0.83)	62 (2.44)	68 (2.68)	56 (2.20)	489 (19.25)	489 (19.25)
UU756040	775 x 612 (30.51 x 24.09)	758 x 595 x 421 (29.84 x 23.43 x 16.57)	**A30P24**	**A30P24G**	686 x 533 (27.01 x 20.98)	555 x 718 (21.85 x 28.27)	—	387 (15.24)	500 (19.68)	21 (0.83)	62 (2.44)	67 (2.64)	56 (2.20)	489 (19.25)	641 (25.24)
UU756040W	775 x 612 (30.51 x 24.09)	758 x 595 x 421 (29.84 x 23.43 x 16.57)	**A30P24**	**A30P24G**	686 x 533 (27.01 x 20.98)	555 x 718 (21.85 x 28.27)	648 x 486 (25.51 x 19.13)	387 (15.24)	500 (19.68)	21 (0.83)	62 (2.44)	67 (2.64)	56 (2.20)	489 (19.25)	641 (25.24)

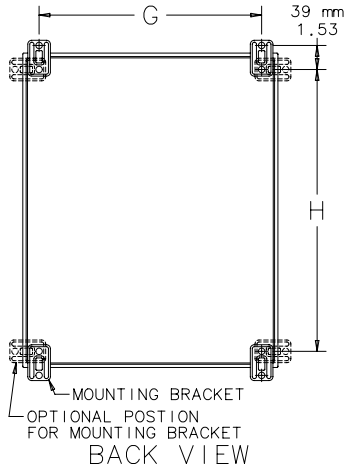
[a]Catalog numbers ending in W have windows in the door.



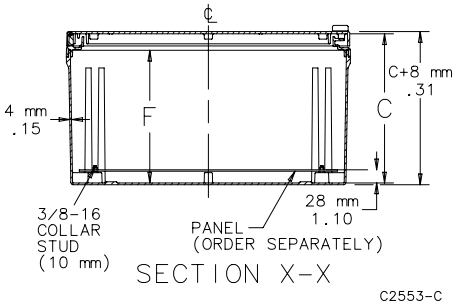
FRONT VIEW



FRONT VIEW WITH DOOR REMOVED



BACK VIEW

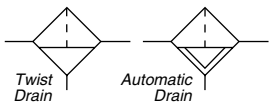


SECTION X-X

C2553-C

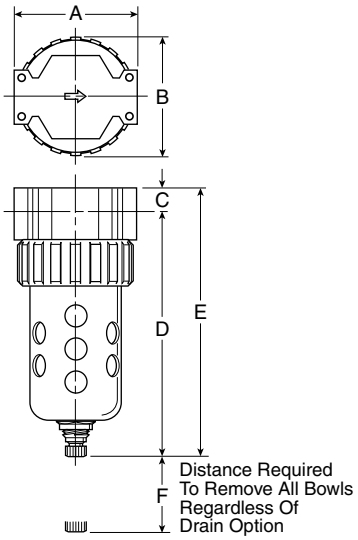
06F Filters – Compact

Item 2



Features

- Excellent water removal efficiency.
- Unique deflector plate and shroud creates a swirling of the air stream ensuring maximum water and dirt separation.
- Large filter element surface guarantees low pressure drop and increased element life.
- Optional Push 'N' Drain requires only fingertip touch to drain. Optional automatic float drain available.
- Shown with recommended metal bowl guard.
- High Flow: 1/4" – 53 SCFM§
  3/8" – 80 SCFM§
  1/2" – 85 SCFM§



Port Size	NPT		BSPP	
	Twist Drain	Automatic Float Drain	Twist Drain	Automatic Float Drain
Poly Bowl‡ / Metal Guard				
1/4"	**06F12AC**	**06F16AC**	06F12AC1	06F16AC1
3/8"	**06F22AC**	**06F26AC**	06F22AC1	06F26AC1
1/2"	**06F32AC**	**06F36AC**	06F32AC1	06F36AC1
Metal Bowl / Sight Gauge				
1/4"	**06F14AC**	**06F18AC**	06F14AC1	06F18AC1
3/8"	**06F24AC**	**06F28AC**	06F24AC1	06F28AC1
1/2"	**06F34AC**	**06F38AC**	06F34AC1	06F38AC1

06F Filter Dimensions		
A 2.81 (71)	**B** 2.74 (70)	**C** .53 (13)
D 5.69 (145)	**D**† 5.74 (146)	**E** 6.22 (158)
E† 6.27 (159)	**F** 2.25 (57)	

Inches (mm)

† With Automatic Float Drain

Standard part numbers shown, for other models refer to ordering information below.

‡ For polycarbonate bowl see Caution on page 2.

§ SCFM = Standard cubic feet per minute at 90 PSIG inlet and 5 PSIG pressure drop.

Ordering Information

06F	1	2	A	C	—	—

Port Size
- **1. 1/4 Inch**
- **2. 3/8 Inch**
- **3. 1/2 Inch**

Bowl Options

Polycarbonate Bowl	Metal Bowl
1. Twist Drain	3. Twist Drain
2. Metal Bowl Guard / Twist Drain	**4. Sight Gauge / Twist Drain**
5. Auto Float Drain	7. Auto Float Drain
6. Metal Bowl Guard / Auto Float Drain	**8. Sight Gauge / Auto Float Drain**
E. Push 'N' Drain	G. Push 'N' Drain
F. Metal Bowl Guard / Push 'N' Drain	**H. Sight Gauge / Push 'N' Drain**
J. Semi-Auto Drain	L. Semi-Auto Drain
K. Metal Bowl Guard / Semi-Auto Drain	**M. Sight Gauge / Semi-Auto Drain**

Elements
- **A. 40 Micron**
- B. 5 Micron
- Z. Adsorber

Engineering Level
- **C. Current**

Options
- **Blank. None**
- P. Differential Pressure Indicator

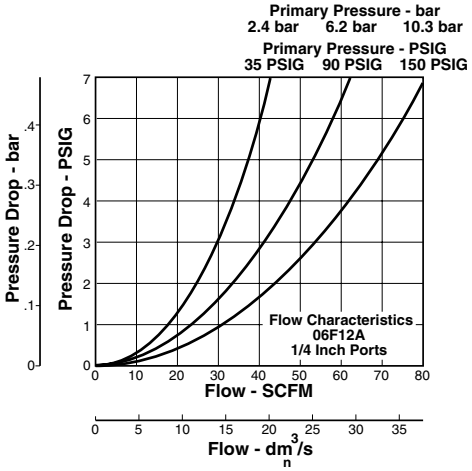
Port Type
- **Blank. NPT**
- 1. BSPP
- 2. BSPT

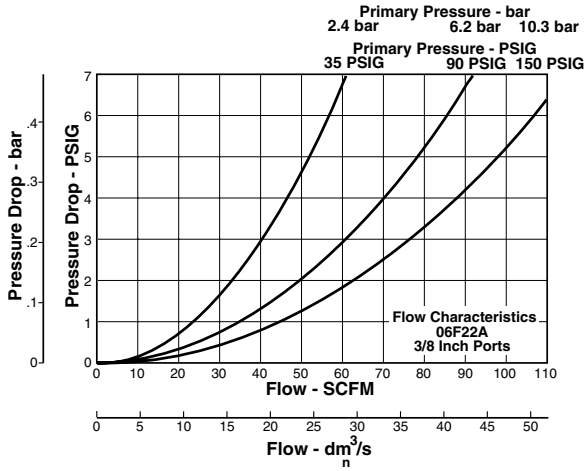
NOTE: BOLD OPTIONS ARE STANDARD.

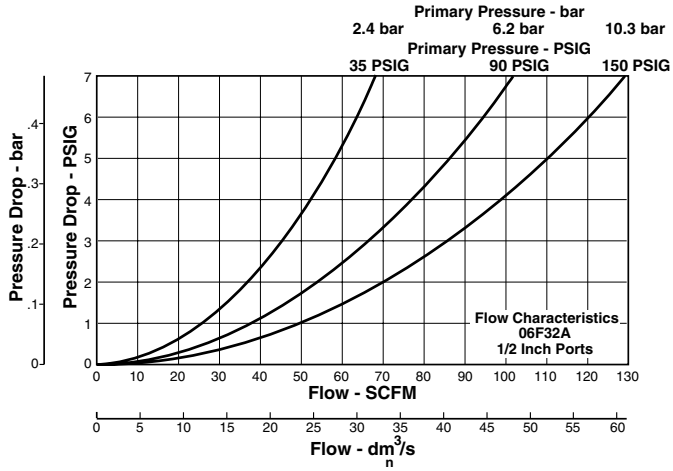
Parker Pneumatic

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatic

Technical Information







06F Filter Kits & Accessories

Bowl Guard Kit PS705P

Bowl Kits –

Poly Bowl –	Automatic Float Drain	PS722P
	Semi-Auto Drain	PS792P
	Twist Drain	PS732P
	Push 'N' Drain	PS704P
Metal Bowl –	Automatic Float Drain	PS726P
	Semi-Auto Drain	PS794P
	Twist Drain	PS734P
	Push 'N' Drain	PS725P
	Sight Gauge / Automatic Float Drain	PS723P
	Sight Gauge / Semi-Auto Drain	PS793P
	Sight Gauge / Twist Drain	PS735P
	Sight Gauge / Push 'N' Drain	PS706P

DPI Replacement Kit PS781P

Drain Kits –	Automatic Float Drain	PS506P
	Semi-Auto Drain	PS511P
	Twist Drain	PS512P
	Push 'N' Drain	PS513P
Filter Element Kits –	40 Micron	PS701P
	5 Micron	PS702P
	Adsorber	PS731P

Mounting Bracket Kit PS743P

Sight Gauge Kit PS714P

Specifications

Bowl Capacity ..... 4.4 Ounces
Sump Capacity ..... 1.75 Ounces
Port Threads ..... 1/4, 3/8, 1/2 Inch

Pressure & Temperature Ratings –
Without Differential Pressure Indicator:
Polycarbonate Bowl – 0 to 150 PSIG (0 to 10.3 bar)
32°F to 125°F (0°C to 52°C)
Metal Bowl – 0 to 250 PSIG (0 to 17.2 bar)
32°F to 175°F (0°C to 80°C)
With Differential Pressure Indicator – 0 to 150 PSIG (0 to 10.3 bar)
32°F to 125°F (0°C to 52°C)
Automatic Float Drain – 10 to 250 PSIG (0.7 to 17.2 bar)
at 125°F (52°C) or less

Weight ..... 1.4 lb. (.6 kg)

Materials of Construction

Body ..... Zinc
Bowls ..... Transparent Polycarbonate or Metal (Zinc) With or Without Sight Gauge
Bowl Guards ..... Steel
Collar ..... Plastic
Deflector, Shroud & Baffle ..... Plastic

Drains –	Twist Drain – Body & Nut	Plastic
	Push 'N' Drain – Body	Nitrile
	Stem	Brass
	Automatic Float Drain – Housing, Float	Plastic
	Seals	Nitrile
	Springs, Push Rod	Stainless Steel
Filter Elements –	40 Micron (Standard)	Plastic
	5 Micron (Optional)	Plastic
	Adsorber (Optional)	Activated Charcoal

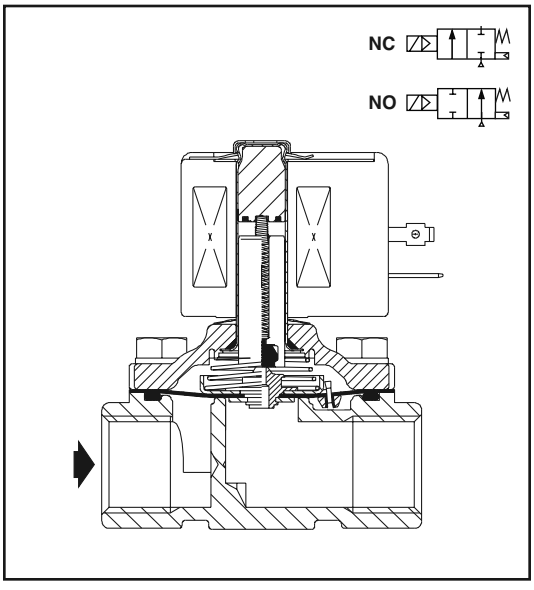
Seals ..... Nitrile
Sight Gauge ..... Polyamide

Parker Pneumatic

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatic

Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High Flow Valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
  - Car wash
  - Laundry equipment
  - Air compressors
  - Industrial water control
  - Pumps



Construction

Valve Parts in Contact with Fluids		
Body	Brass	304 Stainless Steel
Seals and Discs	NBR or PTFE	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
		AC			General Purpose		Explosionproof	
	DC Watts	Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	-	6.1	16	40	238210	-	238214	-
F	11.6	10.1	25	70	238610	238710	238614	238714
F	16.8	16.1	35	180	272610	97617	272614	97617
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
H	30.6	-	-	-	-	74073	-	74073
H	40.6	-	-	-	-	238910	-	238914

Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
See Optional Features Section for other available options.

Nominal Ambient Temp. Ranges

RedHat II/
RedHat AC: 32˚F to 125˚F (0˚C to 52˚C)

RedHat II DC: 32˚F to 104˚F (0˚C to 40˚C)
RedHat DC: 32˚F to 77˚F (0˚C to 25˚C)
(104˚F/40˚C occasionally)

Refer to Engineering Section for details.

Approvals

CSA certified. RedHat II meets applicable CE directives.
Refer to Engineering Section for details.

2/2 SERIES 8210

ASCO®

Specifications (English units)

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)							Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦	
				Max. AC			Max. DC												
			Min.	Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU	AC	DC	Catalog Number	Const. Ref. ④	UL ⑤ Listing	Catalog Number	Const. Ref. ④	UL ⑤ Listing	AC	DC
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																			
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G073 ③	1P	●	8210G036 ③	1P	●	6.1/F	11.6/F
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G093	5D	❍	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G001	6D	❍	-	-	-	6.1/F	11.6/F
3/8	5/8	3	5	300	300	300	-	-	-	175	-	8210G006	5D	❍	-	-	-	17.1/F	-
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G015 ③	2P	●	8210G037 ③	2P	●	6.1/F	11.6/F
1/2	5/8	4	0	150	150	-	40	40	-	180	150	8210G094	5D	❍	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G087	7D	●	17.1/F	11.6/F
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G002	6D	❍	-	-	-	6.1/F	11.6/F
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G007	5D	❍	-	-	-	17.1/F	-
1/2	3/4	4	5	-	300	-	-	300	-	180	125	8210G227	5D	❍	-	-	-	17.1/F	40.6/H
3/4	5/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G088	7D	●	17.1/F	11.6/F
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G009	9D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G095	8D	❍	-	-	-	10.1/F	11.6/F
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G003	11D	❍	-	-	-	6.1/F	11.6/F
3/4	3/4	6	0	-	-	-	200	180	180	-	77	8210B026 ② ‡	10P	-	-	-	-	-	30.6/H
3/4	3/4	6	0	350	300	200	-	-	-	200	-	8210G026 ② ‡	40P	●	-	-	-	16.1F	-
1	1	13	0	-	-	-	100	100	80	-	77	8210B054 ‡	31D	-	8210D089	15D	-	-	30.6/H
1	1	13	0	150	125	125	-	-	-	180	-	8210G054	41D	●	8210G089	45D	●	16.1/F	-
1	1	13	5	150	150	100	125	125	125	180	150	8210G004	12D	❍	-	-	-	6.1/F	11.6/F
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G027 ‡	42P	●	-	-	-	20.1/F	-
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G078 ②	13P	-	-	-	-	17.1/F	-
1 1/4	1 1/8	15	0	-	-	-	100	100	80	-	77	8210B055 ‡	32D	-	-	-	-	-	30.6/H
1 1/4	1 1/8	15	0	150	125	125	-	-	-	180	-	8210G055	43D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G008	16D	❍	-	-	-	6.1/F	11.6/F
1 1/2	1 1/4	22.5	0	-	-	-	100	100	80	-	77	8210B056 ‡	33D	-	-	-	-	-	30.6/H
1 1/2	1 1/4	22.5	0	150	125	125	-	-	-	180	-	8210G056	44D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G022	18D	●	-	-	-	6.1/F	11.6/F
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	-	-	-	6.1/F	11.6/F
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																			
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G033	23D	●	-	-	-	10.1/F	11.6/F
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G011 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G034	23D	●	-	-	-	10.1/F	11.6/F
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G030	37D	●	10.1/F	11.6/F
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G012 ⑧ ⑨	39D	●	-	-	-	10.1/F	11.6/F
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G035	25D	●	-	-	-	10.1/F	11.6/F
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G038	38D	●	10.1/F	11.6/F
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C013	24D	●	-	-	-	-	16.8/F
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G013	46D	●	-	-	-	16.1/F	-
1	1	13	0	125	125	125	-	-	-	180	-	8210B057 ⑥ ⑩	34D	●	-	-	-	20/F	-
1	1	13	5	-	-	-	125	125	125	-	180	8210D014	26D	●	-	-	-	-	16.8/F
1	1	13	5	150	150	125	-	-	-	180	-	8210G014	47D	●	-	-	-	16.1/F	-
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B058 ⑥ ⑩	35D	●	-	-	-	20/F	-
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D018	28D	●	-	-	-	-	16.8/F
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G018	48D	●	-	-	-	16.1/F	-
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B059 ⑥ ⑩	36D	●	-	-	-	20/F	-
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D032	29D	●	-	-	-	-	16.8/F
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G032	49D	●	-	-	-	16.1/F	-
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210 103	30P	●	-	-	-	-	16.8/F
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	-	-	-	16.1/F	-
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210 104	27P	●	-	-	-	-	16.8/F
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-			16.1/F	-

① 5 psi on Air; 1 psi on Water.
② Valve provided with PTFE main disc.
③ Valve includes Ultem (G.E. trademark) piston.
④ Letter "D" denotes diaphragm construction; "P" denotes piston construction.
⑤ ❍ Safety Shutoff Valve; ● General Purpose Valve.
Refer to Engineering Section (Approvals) for details.
⑥ Valves not available with Explosionproof enclosures.
⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts.
⑧ AC construction also has PA seating.
⑨ No disc-holder.
⑩ Stainless steel disc-holder.
‡ Must have solenoid mounted vertical and upright.

Manual Operators

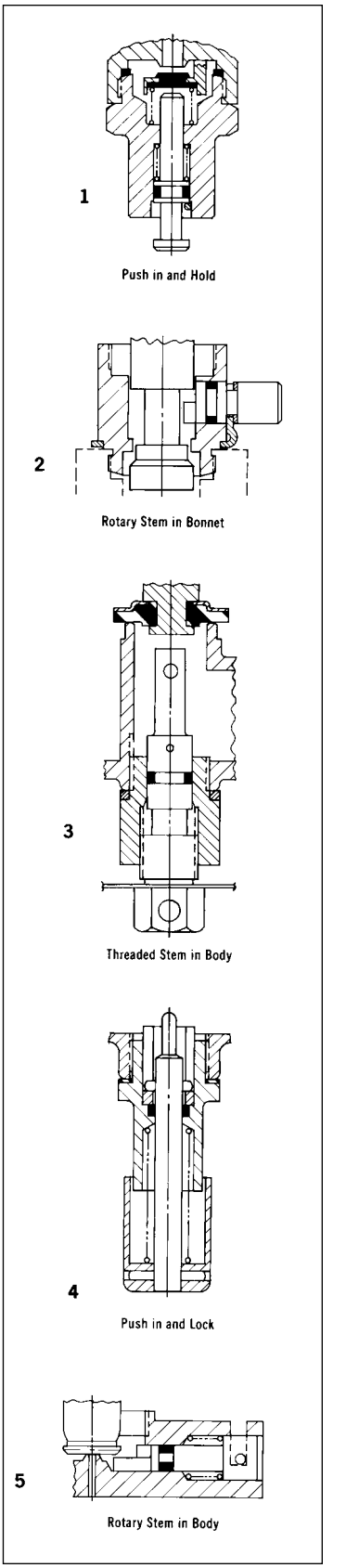
Manual operators are provided to operate the valve manually when electric power is off. There are basically two types of manual operators: momentary and maintained. Series 8320, 8321, and 8342 can be fitted with either type.

To determine which type is available for your valves, check the Construction Reference Numbers in their Series Specification Tables against the Table below. Schematics of the manual operators and how they are fitted to the valves are shown on the right. *If no manual operator is listed or a different type is required, consult your local ASCO office. Add suffix "MO" or "MS" to the catalog number.*

Table 5: Manual Operators

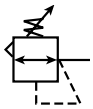
Series Number	Pipe Size (ins.)	Valve Construction Reference Number	Valve Body Materials	Manual Operator Suffix	Type of Manual Operator	Illustration Number
MANUAL OPERATORS ④ FOR 2-WAY SOLENOID VALVES						
8030	3/8, 1/2	1, 2, 3, 11	Brass	MO	Maintained	5
8030	3/4	9	Brass	MO	Maintained	3
8030	3/8, 1/2	1, 2, 3, 11	Stainless Steel	MO	Maintained	5
8030	3/4	10	Stainless Steel	MO	Maintained	3
8210	3/8, 1/2	1, 2	Stainless Steel	MO	Maintained	5
8210	3/8, 1/2	1, 2	Brass	MO	Maintained	5
8210	3/8 to 2 1/2	3, 5, 6, 8, 9, 11, 12, 16, 18, 20, 21	Brass	MO	Maintained	2
8210	3/4 to 1 1/2	10, 31, 32, 33	Brass	MO	Maintained	3
8210	1	42	Brass	MO	Maintained	4
8210	3/4	7	Stainless Steel	MO	Maintained	2
8221	3/8 to 2 1/2	1, 2, 5, 6 ,7, 11, 12	Brass	MO	Maintained	2
8262	1/8	1	Brass	MO	Maintained	3
8262	1/8	1	Stainless Steel	MO	Maintained	3
8262	1/8	8	Brass	MS MO	Maintained Momentary	3 1
8262	1/8	8	Stainless Steel	MS MO	Maintained Momentary	3 1
8262	1/4	2, 4, 6, 16, 17	Brass	MO	Maintained	2
8262	1/4	11, 12 ,13	Stainless Steel	MO ⑥	Maintained	2
8263	3/8	3, 5, 7	Brass	MO	Maintained	2
MANUAL OPERATORS ④ FOR 3-WAY SOLENOID VALVES						
8300	All	All	Brass	MO	Maintained	4
8300	All	All	Stainless Steel	MO	Maintained	4
8316	All	All	Brass	MO	Maintained	2
8320	1/8, 1/4	All	Brass/SS	MS ⑤ MO ①	Maintained Momentary	3 1
8321	All	All	Brass	MS MO	Maintained Momentary	3 1
MANUAL OPERATORS ④ FOR 4-WAY SOLENOID VALVES						
8340	1/4	8340A001, A003, A004	Aluminum	MO	Momentary	1
8342	1/4, 3/8	Single Solenoid Only	Brass/SS	MS MO	Maintained Momentary	4 1
8344 ③	All	All	Brass	MO	Maintained	2
8345	1/4	1	Brass	MO	Maintained	5
8401	1/8, 1/4	All	Aluminum	②	Momentary Maintained	- -
MANUAL OPERATORS ARE ALSO AVAILABLE FOR ALL LOW POWER AND INTRINSICALLY SAFE VALVES (MANUAL OR MOMENTARY). USE SUFFIX "MO."						

① Limited to 100 psi (7 bar) maximum on Normally Open and Universal operation.
② Supplied as standard, no suffix required.
③ Two manual operators required for Dual Solenoid construction.
④ Limited to 250 psi (17 bar) pressure, except where noted otherwise.
⑤ Valves with MS suffix maintain full catalog ratings.
⑥ Manual operator not available for this series with steam application.



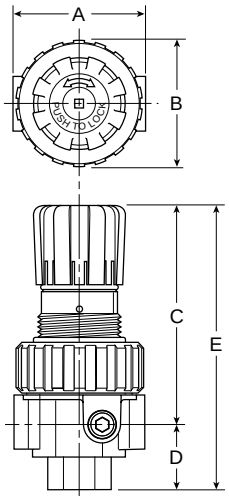
06R Regulators – Compact

Items 4 & 41



Features

- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation.
- Rolling diaphragm for extended life.
- Two high flow 1/4" gauge ports can be used as additional outlets.
- Easily serviced.
- Removable non-rising knob for panel mounting and tamper resistance.
- High Flow: 1/4" – 53 SCFM §
  3/8" – 60 SCFM §
  1/2" – 75 SCFM §



Port Size	NPT	BSPP
Without Gauge		
1/4"	**06R113AC**	06R113AC1
3/8"	**06R213AC**	06R213AC1
1/2"	**06R313AC**	06R313AC1
With 160 PSI Gauge		
1/4"	**06R118AC**	06R118AC1
3/8"	**06R218AC**	06R218AC1
1/2"	**06R318AC**	06R318AC1

06R Regulator Dimensions		
A 2.81 (71)	**B** 2.74 (70mm	**C** 4.69 (119)
D 1.39 (35)	**E** 6.08 (154)	

Inches (mm)

Standard part numbers shown, for other models refer to ordering information below.

NOTE: 2.00 Dia. (51mm) hole required for panel mounting.

§ SCFM = Standard cubic feet per minute at 100 PSIG inlet, 90 PSIG no flow secondary setting and 10 PSIG pressure drop.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed maximum primary pressure rating.

Ordering Information

06R	1	13	A	C	—	—	---

Port Size
- **1. 1/4 Inch**
- **2. 3/8 Inch**
- **3. 1/2 Inch**

Pressure Range
- Without Gauge
- **10. 30 PSIG**
- **11. 60 PSIG**
- **13. 125 PSIG**
- **15. 250 PSIG**
- With Gauge
- **17. 30 PSIG**
- **16. 60 PSIG**
- **18. 125 PSIG**
- **21. 250 PSIG**

Relief
- **A. Relieving**
- L. Non-Relieving

Engineering Level
- **C. Current**

Port Type
- **Blank. NPT**
- 1. BSPP
- 2. BSPT

Options
- **Blank. No Options**
- L.† Preset Non-Adjustable
- P.† Preset Adjustable
- R. Reverse Flow

† Inlet Pressure is 100 PSIG. For other pressures, contact factory.

Preset
- **Blank None**
- XXX* Preset Pressure

* Available Preset Range, 10 to 90 PSIG in 5 PSIG increments. For higher pressures, contact factory. (Example: 065 = 65 PSIG)

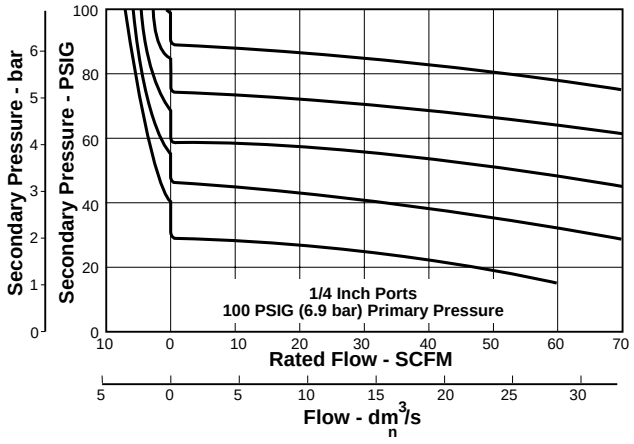
NOTE: BOLD OPTIONS ARE STANDARD.

Parker Pneumatic

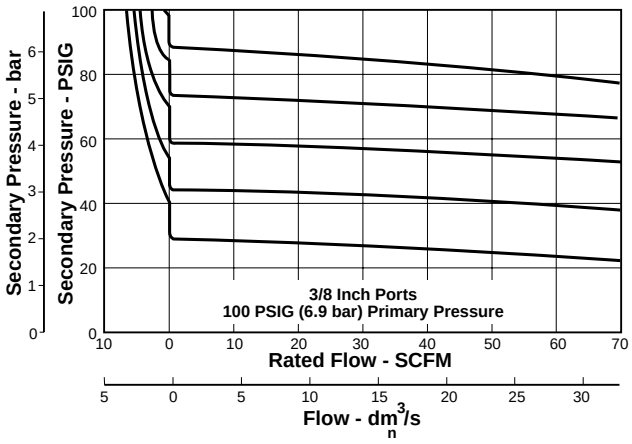
Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatic

Technical Information

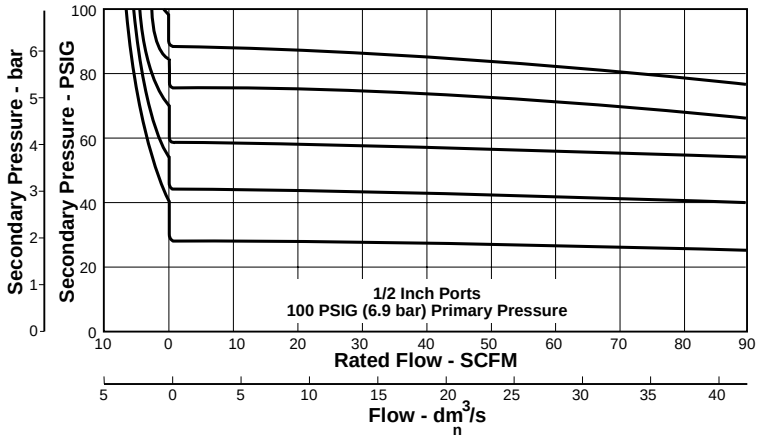
Relief And Flow Characteristics
06R113AC



Relief And Flow Characteristics
06R213AC



Relief And Flow Characteristics
06R313AC



06R Regulator Kits & Accessories

Bonnet Assembly Kit PS715P
Control Knob P04069B
Gauges – 60 PSIG (0 to 400 kPa) P781641
160 PSIG (0 to 1100 kPa) P781642
300 PSIG (0 to 2000 kPa) P781643
Pressure Sensor – 0 to 145 PSI MPS-P31N-PC
Mounting Bracket Kit (Includes Panel Mount Nut) PS707P
Panel Mount Nut – Plastic P04082
Metal P04079B
Reverse Flow Service Conversion Kit –
Relieving PS708RP
Non-Relieving PS709RP
Service Kit – Relieving (Includes Poppet) PS708P
Non-Relieving (Includes Poppet) PS709P
Springs – 1-30 PSIG Range P01698
1-60 PSIG Range P04062
2-125 PSIG Range P04063
5-250 PSIG Range P04064
Tamperproof Kit PS737P

Specifications

Gauge Ports (2) ..... 1/4 Inch
(Can be used as additional High Flow 1/4 Inch Outlet Ports)
Port Threads ..... 1/4, 3/8, 1/2 Inch
Primary Pressure Rating –
Maximum Primary Pressure ..... 250 PSIG (1725 kPa)
Secondary Pressure Ranges –
Standard Pressure ..... 2 to 125 PSIG (14 to 863 kPa)
Low Pressure ..... 1 to 60 PSIG (6.9 to 414 kPa)
High Pressure ..... 5 to 250 PSIG (35 to 1725 kPa)
Temperature Rating ..... 32°F to 175°F (0°C to 80°C)
Weight ..... 1.6 lb. (.7 kg)

Materials of Construction

Adjusting Stem ..... Steel
Body ..... Zinc
Bonnet, Piston Stem, Valve Poppet & Cap ..... Plastic
Collar, Knob ..... Plastic
Diaphragm ..... Nitrile
Seals ..... Nitrile
Springs – Poppet ..... Stainless
Control ..... Steel

Parker Hannifin Corporation
Pneumatic Division
Richland, Michigan
www.parker.com/pneumatic

Low Ampere QOU Miniature Circuit Breakers

QOU unit mount miniature circuit breakers (cable-in/cable-out) are ideal for OEM applications. They have Square D's unique Visi-Trip feature and can be DIN rail-mounted or surface- or flush-mounted using mounting feet.

Low Ampere QOU

General Specifications Common to All Low Ampere QOU Circuit Breakers

- For convenient flush mount, surface mount or DIN mount (symmetrical rail 35 x 7.5 DIN/EN 50 022)
- Single handle with internal common trip
- Terminal lug wire size (1) 14–2 AWG Cu or Al
- Reversible line and load lugs
- Field-installable quick connectors
- UL Listed 48 Vdc (5 k AIR)
- UL Listed as HACR Type—10–70 A
- High magnetic trip circuit breakers (QOU-HM) are recommended for applications where high initial inrush may occur and for individual dimmer applications.
- For DIN mounting rails, see IEC Starters and Relays, Section 18

Table 7.20: QOU Low Ampere Miniature Circuit Breakers

Ampere Rating	1P 120/240 Vac		2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.▲	$ Price	Cat. No.	$ Price
10 k AIR								
10 A	QOU110		QOU210		QOU210H		QOU310	
15 A	QOU115		QOU215		QOU215H		QOU315	
20 A	QOU120		QOU220		QOU220H	**112.00**	QOU320	
25 A	QOU125		QOU225		QOU225H		QOU325	
30 A	QOU130	**26.80**	QOU230	**$ 58.00**	QOU230H		QOU330	**190.00**
35 A	QOU135		QOU235		—	—	QOU335	
40 A	QOU140		QOU240		—	—	QOU340	
45 A	QOU145		QOU245		—	—	QOU345	
50 A	QOU150		QOU250		—	—	QOU350	
60 A	QOU160		QOU260		—	—	QOU360	
70 A	QOU170	**52.00**	QOU270	**114.00**	—	—	QOU370	**242.00**
22 k AIR								
15 A	QOU115VH		QOU215VH		—	—	QOU315VH	
20 A	QOU120VH		QOU220VH		—	—	QOU320VH	**284.00**
25 A	QOU125VH		QOU225VH		—	—	QOU325VH	
30 A	QOU130VH		QOU230VH		—	—	QOU330VH	
35 A	QOU135VH	**67.00**	QOU235VH	**126.00**	—	—	—	—
40 A	QOU140VH		QOU240VH		—	—	—	—
45 A	QOU145VH		QOU245VH		—	—	—	—
50 A	QOU150VH		QOU250VH		—	—	—	—
60 A	QOU160VH		QOU260VH		—	—	—	—

▲ QOU-H interrupting rating is 5 kA at 240 Vac.

Table 7.21: QOU-HM Miniature Circuit Breakers (10 k AIR)

Ampere Rating	1P 120/240 Vac		2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price
15 A	QOU115HM	**26.80**	—	—	—	—	—	—
20 A	QOU120HM		—	—	—	—	—	—

Table 7.22: QYU UL1077 Recognized Supplementary Protectors (5 k AIR)

Ampere Rating	1P 277 Vac		2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price
15 A	QYU115		—	—	—	—	—	—
20 A	QYU120	**81.00**	—	—	—	—	—	—
25 A	QYU125		—	—	—	—	—	—
30 A	QYU130		—	—	—	—	—	—

High Ampere QOU Circuit Breakers

High Ampere QOU

General Specifications Common to All High Ampere QOU Circuit Breakers

- Flush mount, surface mount, and DIN rail mount.
- Internal common trip.
- Non-reversible line and load lugs.
- Terminal lug wire size (1) 12– 2/0 AWG Cu or Al.
- UL Listed 60 Vdc per pole (5 k AIR). (**Note:** except switches)
- UL Listed as HACR type, 80–125 A.
- Non-automatic switches have the same physical packaging as miniature circuit breakers, but provide no overcurrent or short circuit protection. They are UL Listed per UL1087 and are CSA certified.

Table 7.23: QOU High Ampere Miniature Circuit Breakers (10 k AIR)

Ampere Rating	1P 120/240 Vac		2P 120/240 Vac		2P 240 Vac		3P 240 Vac	
	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price	Cat. No.	$ Price
80 A	QOU180		QOU280		—	—	QOU380	
90 A	QOU190	**117.00**	QOU290	**164.00**	—	—	QOU390	**277.00**
100 A	QOU1100		QOU2100		—	—	QOU3100	
125 A	—	—	QOU2125	**301.00**	—	—	—	—

Table 7.24: QOU Non-Automatic Switches

Ampere Rating	1P 120 Vac	$ Price	2P 120/240 Vac	$ Price	2P 240 Vac	$ Price	3P 240 Vac	$ Price
	Cat. No.		Cat. No.		Cat. No.		Cat. No.	
90 A	—	—	—	—	QOU200	**58.00**	QOU300	**190.00**
100 A	—	—	—	—	QOU2000	**164.00**	QOU3000	**277.00**
125 A	—	—	—	—	QOU20001	**301.00**	QOU30001	**477.00**

Interrupting Ratings . . . . . Page 7-3
Accessories . . . . . Page 7-12, 7-15
Dimensions. . . . . Page 7-53

RTE Series — Analog Timers

Item 8

Key features of the RTE series include:

- 20 time ranges and 10 timing functions
- Time delays up to 600 hours
- Space-saving package
- High repeat accuracy of ± 0.2%
- ON and timing OUT LED indicators
- Standard 8- or 11-pin and 11-blade termination
- 2 form C delayed output contacts
- 10A Contact Rating

TÜV PRODUCT SERVICE Cert. No. E9950913332316 (EMC, RTE)
Cert. No. BL960813332355 (LVD, RTE)

c UL us UL Listed File No. E66043

CE

General Specifications

Operation System		Solid state CMOS Circuit		
Operation Type		Multi-Mode		
Time Range		0.1sec to 600 hours		
Pollution Degree		2 (IE60664-1)		
Over voltage category		III (IE60664-1)		
Rated Operational Voltage	AF20	100-240V AC(50/60Hz)		
	AD24	24V AC(50/60Hz)/24V DC		
	D12	12V DC		
Voltage Tolerance	AF20	85-264V AC(50/60Hz)		
	AD24	20.4-26.4V AC(50/60Hz)/21.6-26.4V DC		
	D12	10.8-13.2V DC		
Input off Voltage		Rated Voltage x10% minimum		
Ambient Operating Temperature		-20 to +65°C (without freezing)		
Ambient Storage and Transport Temperature		-30 to +75°C (without freezing)		
Relative Humidity		35 to 85%RH (without condensation)		
Atmospheric Pressure		80kPa to 110kPa (Operating), 70kPa to 110kPa (Transport)		
Reset Time		100msec maximum		
Repeat Error		±0.2%, ±20msec*		
Voltage Error		±0.2%, ±20msec*		
Temperature Error		±0.5%, ±20msec*		
Setting Error		±10% maximum		
Insulation Resistance		100MΩ minimum (500V DC)		
Dielectric Strength		Between power and output terminals: 2000V AC, 1 minute		
		Between contacts of different poles: 2000V AC, 1 minute		
		Between contacts of the same pole:1000V AC, 1 minute		
Vibration Resistance		10 to 55Hz amplitude 0.5mm² hours in each of 3 axes		
Shock Resistance		Operating extremes: 98m/sec² (10G)		
		Damage limits: 490m/sec² (50G)		
		3 times in each of 3 axes		
Degree of Protection		IP40 (enclosure) (IEC60529)		
Power Consumption (Approx.)	TYPE	RTE-P1, -B1		RTE-P2, -B2
	AF20 120V AC/60Hz	6.5VA		6.6VA
	AF20 240V AC/60Hz	11.6VA		11.6VA
	24V AC 60Hz/DC	3.4VA/1.7W		3.5VA/1.7W
	D12	1.6W		1.6W
Mounting Position		Free		
Dimensions	RTE-P1, P2	40Hx 36W x 77.9D mm		
	RTE-B1, B2	40Hx 36W x 74.9D mm		
Weight (Approx.)		RTE-P1	RTE-P2	RTE-B1, -B2
		87g	89g	85g

Contact Ratings

Contact Configuration		2 Form C, DPDT (Delay output)
Allowable Voltage / Allowable Current		240V AC, 30V DC / 10A
Maximum Permissible Operating Frequency		1800 cycles per hour
Rated Load	Resistive	10A 240V AC, 30V DC
	Inductive	7A 240V AC, 30V DC
	Horse Power Rating	1/6 HP 120V AC, 1/3 HP 240V AC
Life	Electrical	500,000 op. minimum (Resistive)
	Mechanical	50,000,000 op. minimum

*For the value of the error against a preset time, whichever the largest. applies.

Part Numbering Guide

RTE series part numbers are composed of 4 part number codes. When ordering a RTE series part, select one code from each category.
Example: **RTE-P1AF20**

RTE	—	P	1	AF20
① Series		② Terminal Style	③ Function Group	④ Input Voltage

Part Numbers: RTE Series

	Description	Part Number Code	Remarks
① Series	RTE series	RTE	For internal circuits, see next page.
② Terminal Style	Pin	P	Select one only.
	Blade	B	
③ Function Group	ON-delay, interval, cycle OFF, cycle ON	1	Each function group has different timing functions.
	ON-delay, cycle OFF, cycle ON, signal ON/OFF delay, OFF-delay, one-shot	2	See page 794.
④ Input Voltage	100 to 240V AC(50/60Hz)	AF20	
	24V AC(50/60Hz)/24V DC	AD24	
	12V DC	D12	

Part Numbers

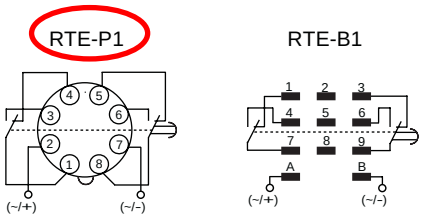
Voltage	Power Triggered		Start Input Triggered	
	8-Pin	Blade	11-Pin	Blade
12V DC	RTE-P1D12	RTE-B1D12	RTE-P2D12	RTE-B2D12
24V AC/DC	RTE-P1AD24	RTE-B1AD24	RTE-P2AD24	RTE-B2AD24
100-240V AC	RTE-P1AF20	RTE-B1AF20	RTE-P2AF20	RTE-B2AF20

Time Range Determined by Time Range Selector and Dial Selector

	Dial	0 - 1	0 - 3	0 - 10	0 - 30	0 - 60
Range	Second	0.1 sec - 1 sec	0.1 sec - 3 sec	0.2 sec - 10 sec	0.6 sec - 30 sec	1.2 sec - 60 sec
	Minute	1.2 sec - 1 min	3.6 sec - 3 min	12 sec - 10 min	36 sec - 30 min	1.2 min - 60 min
	Hour	1.2 min - 1 hr	3.6 min - 3 hr	12 min - 10 hr	36 min - 30 hr	1.2 hr - 60 hr
	10 Hours	12 min - 10 hr	36 min - 30 hr	2 hr - 100 hr	6 hr - 300 hr	12 hr - 600 hr

Timing Diagrams

RTE-P1, -B1



1. RTE-B1: Do not apply voltage to terminals #2, #5 & #8.
2. IDEC sockets are as follows: RTE-P1: SR2P-06* pin type socket, RTE-B1: SR3B-05* blade type socket, (*-may be followed by suffix letter A,B,C or U).

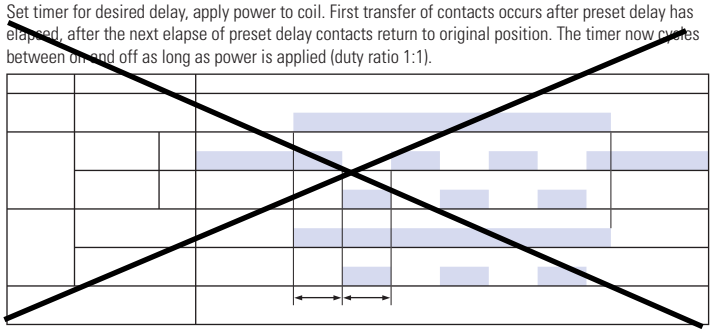
A: ON-Delay 1 (power start)

Set timer for desired delay, apply power to coil. Contacts transfer after preset time has elapsed, and remain in transferred position until timer is reset. Reset occurs with removal of power.

Item	Terminal Number		Operation
Power	(1) 2 - 7 (2) A - B		
Delayed Contact	(1) 1 - 4, 5 - 8 (2) 1 - 7, 3 - 9	(NC)	
	(1) 1 - 3, 6 - 8 (2) 4 - 7, 6 - 9	(NO)	
Indicator	PWR		
	OUT		
Set Time			T

C: Cycle 1 (power start, OFF first)

Set timer for desired delay, apply power to coil. First transfer of contacts occurs after preset delay has elapsed, after the next elapse of preset delay contacts return to original position. The timer now cycles between on and off as long as power is applied (duty ratio 1:1).

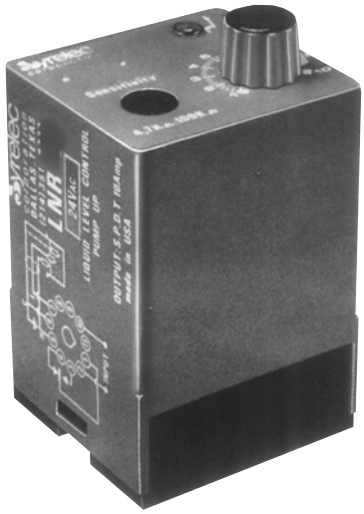


Crouzet

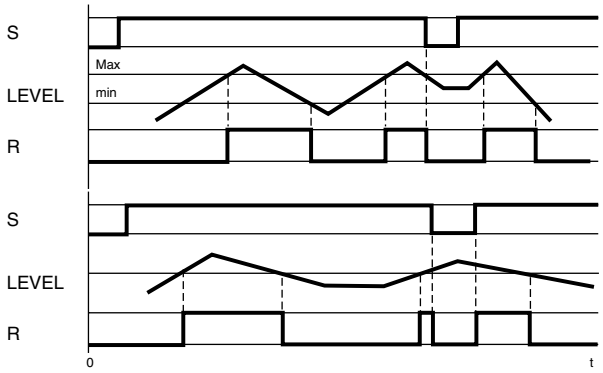
Item 9

NR SERIES
LIQUID LEVEL CONTROL
PUMP DOWN

UL listed CSA recognized



- **24 VAC to 220 VAC Operating Voltages**
- **4.7 kΩ to 100 kΩ Sensitivity**
- **LED Relay Indicator**
- **10 Amp SPDT Relay**



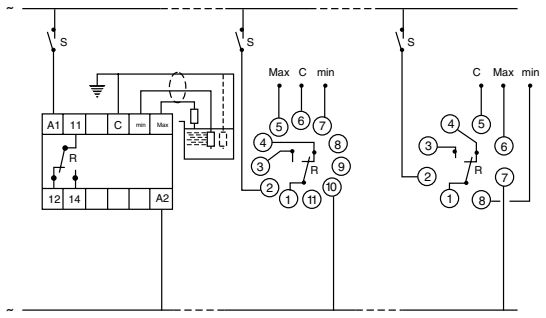
The output relay energizes when the liquid level reaches the high probe. The relay de-energizes when the liquid falls below the low probe. This control can also be used with only two probes by connecting the maximum and common terminals together. The output is energized when the level reaches the low probe. In both functions, if the container is conductive, it may be used as the common probe in some applications.

SPECIFICATIONS:

Input	24, 48, 110, 220 VAC ±15% (50/60 Hz)	
Maximum power consumption	24 VAC: 1.5 VA	
	48 VAC: 1.7 VA	
	110 VAC: 2 VA	
	220 VAC: 2 VA	
Output	SPDT relay	
Contact material	AgCdO	
Maximum loading	10A AC resistive	8A DC inductive
Maximum switching voltage	250 VAC	250 VDC
Relay maximum power rating	2500 VA	80 W
Mechanical life of relay	3 x 10^7 operations	
Electrical life of relay	2 x 10^5 at 2200 VA resistive load	
Probe isolation	Electrodes: 2000 VAC	
Probe sensitivity	4.7 K to 100 K ohms	
Probe voltage	24 VAC, 60 Hz	
Probe current	2 mA max.	
Operating temperature	+14°F to 140°F	-10°C to +60°C
Weight	4.6 oz. (130g)	

WIRING DIAGRAM:

DNR LNR PNR



ORDERING INFORMATION:

P — MOUNTING | **NR** — SERIES | **110A** — INPUT POWER

MOUNTING
D = DIN-rail or panel mounting
L = 11 pin plug-in
P = 8 pin plug-in

SERIES
NR

INPUT POWER
24A = 24 VAC
48A = 48 VAC
110A = 110 VAC
220A = 220 VAC

Products and specifications subject to change without notice.
Consult factory for application assistance.

Bourdon Tube Pressure Gauges
Stainless Steel Series
Type 232.53 - Dry Case
Type 233.53 - Liquid-filled Case

ITEM 11

Applications

- With liquid filled case for applications with high dynamic pressure pulsations or vibration
- Suitable for corrosive environments and gaseous or liquid media that will not obstruct the pressure system
- Process industry: chemical/petrochemical, power stations, mining, on and offshore, environmental technology, mechanical engineering and plant construction

Special features

- Excellent load-cycle stability and shock resistance
- All stainless steel construction
- Positive pressure ranges to 15,000 psi

Bourdon Tube Pressure Gauge Model 232.53

Standard Features

Design
ASME B40.100 & EN 837-1

Sizes
2”, 2½” & 4” (50, 63 and 100 mm)

Accuracy class
2” & 2½”: ± 2/1/2% of span (ASME B40.100 Grade A)
4”: ± 1.0% of span (ASME B40.100 Grade 1A)

Ranges
Vacuum / compound to 200 psi
Pressure from 15 psi to 15,000 psi
or other equivalent units of pressure or vacuum

Working pressure

2” & 2½”:	Steady:	3/4 scale value
	Fluctuating:	2/3 full scale value
	Short time:	full scale value
4 ”:	Steady:	full scale value
	Fluctuating:	0.9 x full scale value
	Short time:	1.3 x full scale value

Operating temperature
Ambient: -40°F to +140°F (-40°C to +60°C) - dry
-4°F to +140°F (-20°C to +60°C) - glycerine filled
-40°F to +140°F (-40°C to +60°C) - silicone filled
Medium: +212°F (+100°C) maximum

Temperature error
Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% for every 18°F (10°C) rising or falling. Percentage of span.

Weather protection
Weather tight (NEMA 4X / IP65)

Pressure connection
Material: 316L stainless steel
Lower mount (LM) or center back mount (CBM)
Lower back mount (LBM) for 4” size
1/8” NPT, 1/4” NPT or 1/2” NPT limited to wrench flat area

Bourdon tube
Material: 316L stainless steel
2” & 2½”: ≤ 1,000 PSI: C-type,
≥ 1,500 PSI: helical type
4”: ≤ 1,500 PSI: C-type,
≥ 2,000 PSI: helical type

Movement
Stainless steel

Dial
White aluminum with black lettering, 2½” with stop pin

Pointer
Black aluminum

Case
304 stainless steel with vent plug and SS crimp ring.
Welded case / socket connection

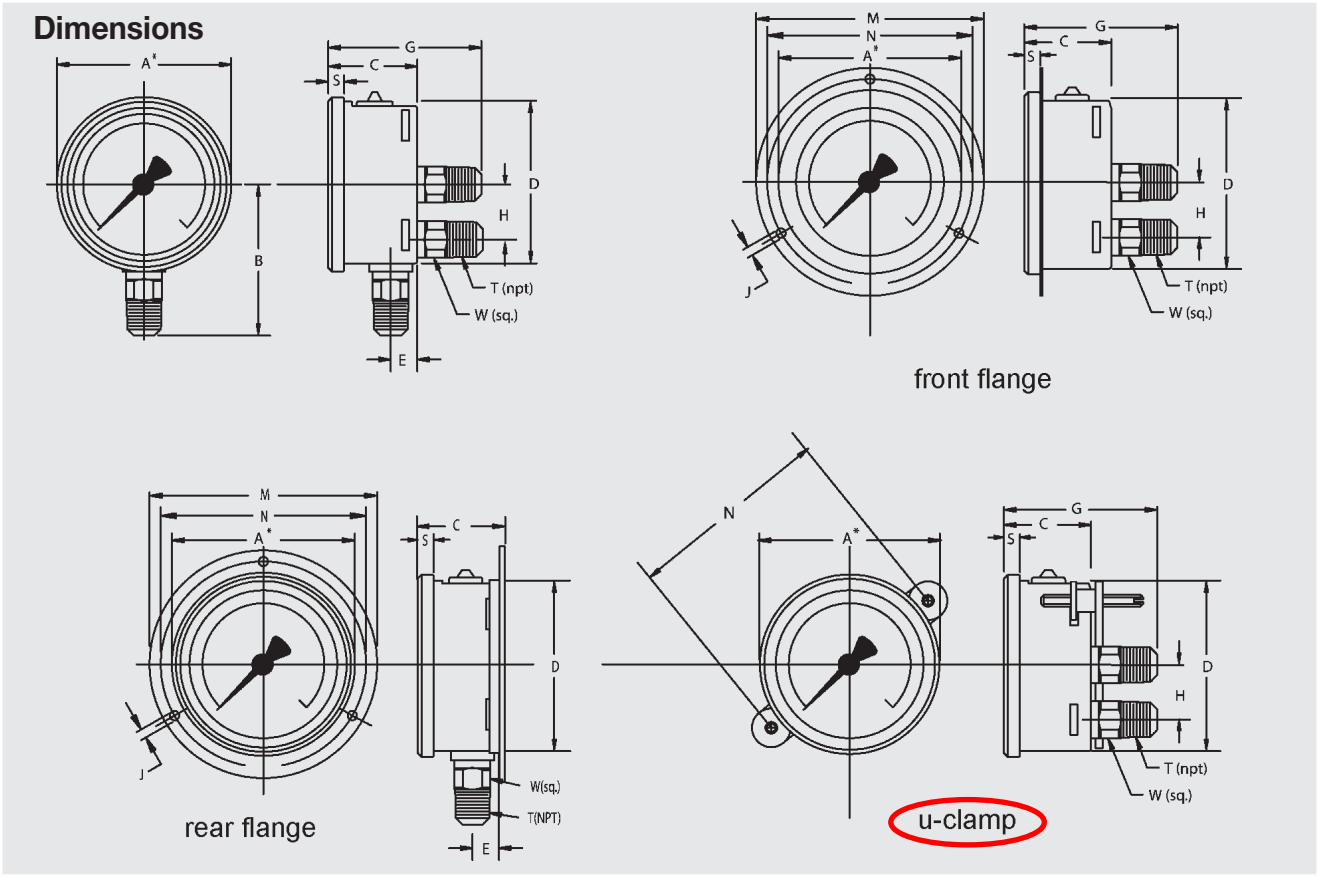
Window
Polycarbonate

Liquid filling
~~Glycerine 99.7% Type 233.53~~

Optional extras

- SS restrictor
- SS front or rear flanges
- Zinc-plated steel or SS u-clamp bracket (field installable)
- Cleaned for oxygen service
- Red drag pointer for mark pointer
- Other pressure connections
- Silicone or Fluorolube case filling
- Other pressure scales available:
  bar, kPa, MPa, kg/cm² and dual scales

Dimensions



Size		A	B	C	D	E	G	H	J	K	L	M	N	S	T	W	Weight	
2”	mm	55	48	30	50	12	53	-	3.6	n/a	6.5	71	60	5.5		14	0.27 lb.	dry
	in	2.17	1.89	1.18	1.97	0.47	2.09	-	0.14	n/a	0.26	2.80	2.36	0.22	1/4”	0.55	0.33 lb.	filled
2.5”	mm	69	54	32	62	13	54	-	3.6	72	7.5	85	75	6.5		14	0.36 lb.	dry
	in	2.69	2.13	1.26	2.45	0.51	2.13	-	0.14	2.83	0.30	3.35	2.95	0.26	1/4”	0.55	0.44 lb.	filled
4”	mm	107	87	48	100	15.5	79.5	30	4.8	109	9	132	116	8		22	1.10 lb.	dry
	in	4.21	3.43	1.89	3.91	0.61	3.13	1.18	0.19	4.29	0.35	5.20	4.57	0.31	1/2”	0.87	1.76 lb.	filled

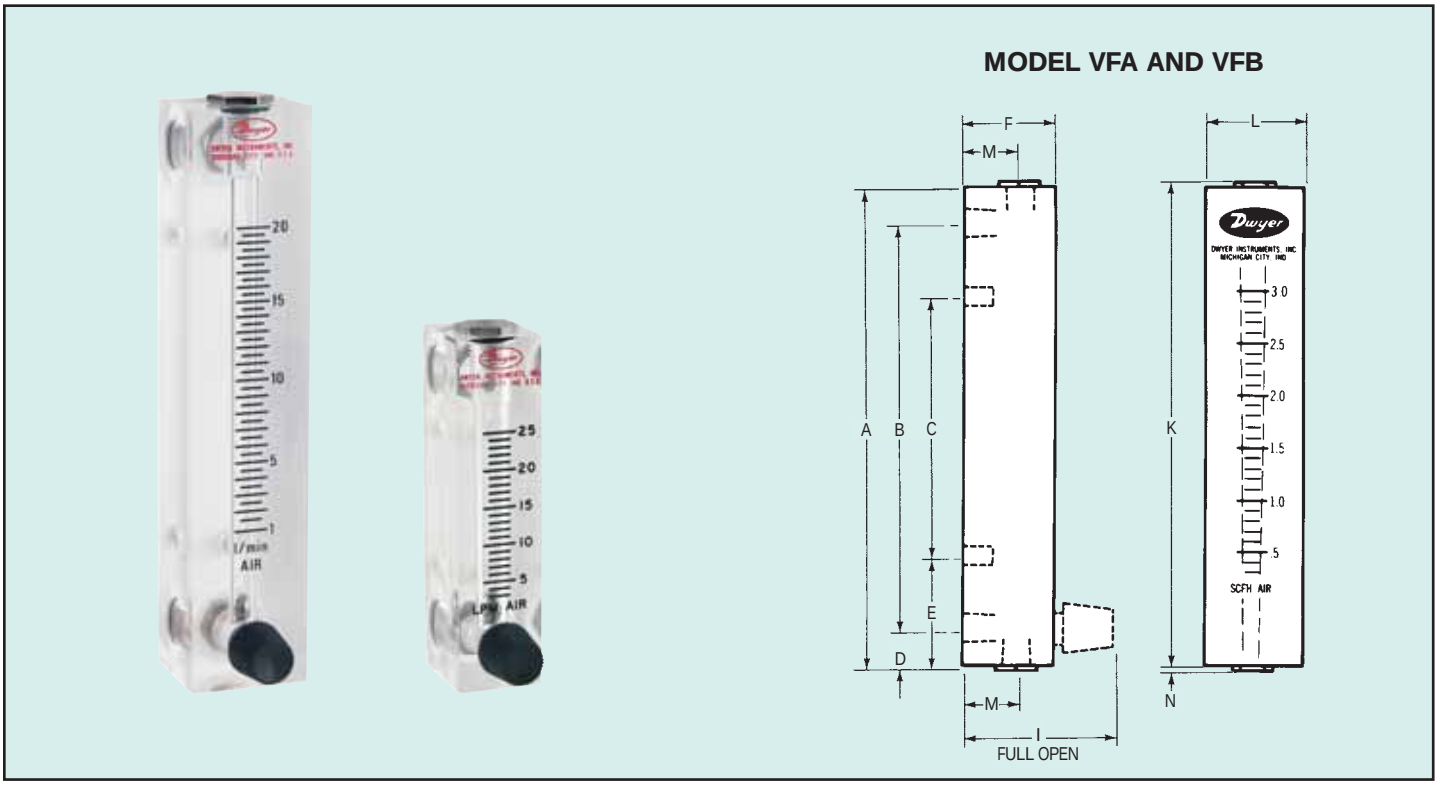
Recommended panel cutout is dimension D + 1 mm

Ordering information
Pressure gauge model / Nominal size / Scale range / Size of connection / Optional extras required
Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.
Modifications may take place and materials specified may be replaced by others without prior notice.

WIKA Instrument Corporation
1000 Wiegand Boulevard
Lawrenceville, GA 30045
Tel (770) 513-8200 Toll-free 1-888-WIKA-USA
Fax (770) 338-5118
E-Mail info@wika.com
www.wika.com

Series VFA & VFB Visi-Float® Flowmeters

Used to Indicate or Manually Control Air or Water Flow



The Visi-Float® flowmeter bodies are cut and precision machined from solid, clear acrylic plastic blocks. This construction not only produces a handsome finished product, but permits complete visual inspection. As a result, the Visi-Float® flowmeters are especially popular for medical and laboratory equipment applications.

Scales are easy to read – The front scale location and white background provides excellent visibility. The direct reading scales are hot stamped into the plastic and will not wear off. Mid-range calibration is established with a master flowmeter. Accuracy is ±5% of full scale for VFA models, ±3% for VFB. Scales average 2" long on the VFA models, 4" long on VFB.

Durable and attractive construction – The machined acrylic bodies of the Visi-Float® flowmeters are practically unbreakable. Fabrication is backed by over 60 years of experience in acrylic instrument machining. The tapered bore is precision machined to a smooth surface that provides perfect visibility of the indicating float. The VFA and VFB models are available with either brass or stainless steel inlet and outlet connections and are tapped for 1/8″ NPT thread. VFB models 85 and 86 have either 1/4″ back or 3/8″ end connections. All standard models employ Buna-N "O" rings for leak proof operation and are available with either back or end connections for horizontal or vertical piping. Precision metering valves in brass or stainless steel are available for most VFA and VFB models.

DIMENSION-IN INCHES		
	Model VFA	Model VFB
A	4	6-1/2
B	3 (1/8 female NPT)	5-1/2 (1/8 female NPT)
C	1-5/8 (10-32 Thread)	3-1/2 (10-32 thread)
D	1/2	1/2
E	1-3/16	1-1/2
F	1-1/4	1-1/4
I	2-1/16 (BV or SSV)	2-1/16 (BV or SSV)
K	4-3/32	6-19/32
L	1	1-3/8
M	3/4 (EC)	3/4(EC)
N	3/32 (EC)	3/32 (EC)

Easy installation – All Visi-Float® flowmeters have metal mounting inserts on rear for panel mounting. They can also be supported directly by system piping.

Special Multi-Column Visi-Float® Flowmeters

Perfect for OEM applications, Visi-Float® flowmeters can be custom made with up to 10 columns in a single block of acrylic plastic. Available with or without valves. Consult factory for more information.

OEM Specials – Special flowmeter designs can be supplied to meet a wide range of requirements and specific applications. These include: on-off plunger and push-to-test valves, special gas or fluid calibration, special ranges, scales, name brand or other identification. Pointer flags can be furnished for instant visual reference. For specific information, please supply an outline of your requirements.

How To Order

Series—Range No.—Valve—Option
Example: VFA-9-BV
Series VFA with 20-200 SCFH Air Range & Brass Valve

SPECIFICATIONS

Service: Compatible gases & liquids.

Wetted Materials:

Body: Acrylic plastic.

O-ring: Buna-N (Fluoroelastomer available).

Metal Parts: Brass standard, stainless steel optional.

Float: Stainless steel, black glass, aluminum, K Monel depending on range.

Temperature & Pressure Limits:

Without Valve: 100 psig (6.9 bar) @ 150°F (65°C);
150 psig (10 bar) @ 100°F (38°C).
With Valve: 100 psig (6.9 bar) @ 120°F (48°C).

Accuracy: VFA = 5% of full scale; VFB= 3% of full scale.

Process Connection: 1/8″ female NPT. VFB ranges 85 and 86 have 1/4″ NPT back connections or 3/8″ NPT end connections. These ranges not available with brass valves.

Scale Length: VFA 2″ typical length; VFB 4″ typical length.

Mounting Orientation: Mount in vertical position.

Weight: VFA: 4.0-4.8 oz (.11-.14 kg). VFB: 7.2-8.8 oz (.20-.25 kg).

Please note that we provide a customized VFB-55-SSV that has a non removable valve stem so the part number is not in the catalog.

VFA SERIES

Model	Description
VFA-X	Standard VFA
VFA-X-SS	VFA with Stainless Metal Wetted Parts
VFA-X-BV	VFA with Brass Valve
VFA-X-SSV	VFA with Stainless Steel Valve
VFA-X-EC	VFA with End Connections
VFA-X-EC-SS	VFA with End Connections and Stainless Steel Metal Wetted Parts

Options & Accessories
-PF, Red ABS Plastic Pointer Flag
-VIT, Fluoroelatomer O-rings
RKA, Pressure Regulator

VFB SERIES

Model	Description
VFB-X	Standard VFB
VFB-X-SS	VFB with Stainless Metal Wetted Parts
VFB-X-BV	VFB with Brass Valve
VFB-X-SSV	VFB with Stainless Steel Valve
VFB-X-EC	VFB with End Connections
VFB-X-EC-SS	VFB with End Connections and Stainless Steel Metal Wetted Parts

Options & Accessories
-PF, Red ABS Plastic Pointer Flag
-VIT, Fluoroelastomer O-rings
RK-VFB, Pressure Regulator

POPULAR RANGES

Model VFA — 2" Scale

Range No.	Range SCFH Air	Range No.	Range LPM Air
1	.1-1	21	.06-0.5
2	.2-2	22	.15-1
3	.6-5	23	.6-5
4	1-10	24	1-10
5	2-20	25	3-25
6	4-30	26	6-50
7	5-50	27	10-100
8	10-100		
9	20-200		
	CC Water per min.		**Gal. Water per hour**
32	6-50	41	.6-5
33	10-100	42	2-10
34	20-200	43	3-20
		44	8-40

POPULAR RANGES

Model VFB — 4" Scale

Range No.	Range SCFH Air	Range No.	LPM Air
50	.3-3	65	.2-4
91⁺	1-10	66	1-10
51⁺	2-20	67	1-20
52	4-40	68	3-30
53⁺	10-100	69	4-40
54⁺	10-150		**CC/Min. Water**
55⁺	20-200	82	2-30
	SCFM Air		**GPH Water**
90	.3-3	80⁺	.5-12
	CC/Min. Air	83⁺	1-20
60	100-1000	84	6-40
		81	6-60
			GPM Water
		85*	.2-2
		86*	.6-5

⁺ For dual range models in English and Metric add "D" to end of Range No.
* Ranges 85 and 86 add $16.00 to VFB prices. Not available with brass valve.

Items 17-38

Gaugeable Tube Fittings and Adapter Fittings

- Available in tube sizes from 1/16 to 2 in. and 2 to 50 mm
- Consistent gaugeability upon initial make-up
- Easy to disconnect and retighten
- Wide variety of materials and configurations

Swagelok

Features

Two-ferrule mechanical grip design

- Allows the front ferrule to seal while the back ferrule grips
- Uses consistent geometry (instead of torque) for gauge-able make-up
- Overcomes variations in tube materials, wall thickness, and hardness
- Provides excellent vibration resistance
- Allows reliable remake connections

Installation

- Easy to install using hand tools
- No torque is transmitted to tubing during installation
- Swagelok gap inspection gauge assures sufficient pull-up upon initial installation

An installation training seminar is available.

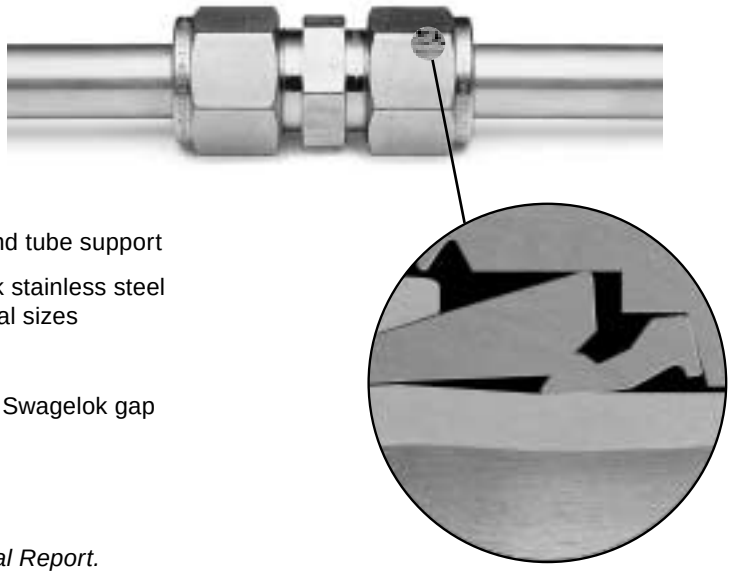
Contact your independent Swagelok sales and service representative for details.

Installation instructions are available (see page 54).

Advanced Geometry Back Ferrule Design

is standard on all 1/4 to 1/2 in. and 6 to 12 mm Swagelok stainless steel tube fittings.

To help installers make more consistent, leak-tight tube connections, Swagelok stainless steel tube fittings, in sizes from 1/4 to 1/2 in. and 6 to 12 mm, include a patented advanced-geometry back ferrule. This back ferrule design provides:



- Excellent gas-tight sealing and tube-gripping action
- Reduced potential for improper pull-up
- Consistent remakes
- Excellent vibration fatigue resistance and tube support
- Full compatibility with original Swagelok stainless steel tube fittings and front ferrules of identical sizes
- Easy 1 1/4-turn installation
- Gaugeability on initial installation using Swagelok gap inspection gauges

For additional information, see the *Swagelok Advanced Tube Fitting Technical Report.*

Ordering Information

Add the material designator as a prefix to the basic ordering number. Example: **SS**-400-1-4

Material	Designators
316 Stainless Steel	SS
Alloy 20	C20
Alloy 400/R-405	M
Alloy 600	INC
Alloy C-276	HC
Aluminum	A
Brass	B
Carbon Steel	S①
Nylon	NY
PTFE	T
SAF 2507™	2507
Titanium	TI

Used outside of Air Control Panel

Used inside of Air Control Panel

① Includes stainless steel back ferrule.

- SAE/MS positionable fittings are available in carbon steel and stainless steel only.
- Minimum order quantities may apply to certain materials and configurations.
- For SAF 2507 super duplex fittings, see the *Swagelok Gaugeable SAF 2507™ Super Duplex Tube Fittings* catalog.
- For PFA tube fittings, see the *Swagelok PFA Tube Fittings and PFA Tubing* catalog.
- Heavy-wall fittings are available only in 316 stainless steel. The basic ordering numbers for these fittings include the material designator. See the *Swagelok High-Pressure Fittings* catalog.
- Contact your independent Swagelok sales and service representative for information about additional sizes and special alloys.

Dimensions

- Dimensions, in inches (millimeters), are for reference only and are subject to change.
- Dimensions are shown with Swagelok nuts finger-tight. For Swagelok nut dimensions, see page 45.
- CAD templates are available on www.swagelok.com.

Materials Standards

Material	Bar Stock①	Forgings②
316 Stainless Steel	ASTM A276 ASME SA479	ASTM A182 ASME SA182
Alloy 20	ASTM B473	ASTM B462
Alloy 400/R-405	ASTM B164 ASME SB164	ASTM B564 ASME SB564
Alloy 600	ASTM B166 ASME SB166	ASTM B564 ASME SB564
Alloy C-276	ASTM B574	ASTM B564
Aluminum	ASTM B211	ASTM B247
Brass	ASTM B16 ASTM B453	ASTM B283
Carbon Steel	ASTM A108	—
Nylon	ASTM D4066	—
PTFE	ASTM D1710	ASTM D3294
SAF 2507	ASTM A479	ASTM A182
Titanium	ASTM B348	ASTM B381

① Includes straight configurations.
② Includes all elbows, crosses, and tees.

O-rings

O-seal fittings include a 70 durometer Buna O-ring. Other straight thread fittings with O-rings include a 90 durometer fluorocarbon FKM O-ring. Other O-ring materials are available upon request. O-rings are coated with a thin film of silicone-based lubricant. Removal of factory applied lubricants may alter performance.

Plating and Coating

For improved performance, fitting components receive additional processing. Fitting bodies that are subjected to further processing (plating and coating) are shown below:

Fitting Material	Body Process
Aluminum	Anodized, hydrocarbon film
Alloy 400/R-405, Alloy 20 Alloy C-276, Alloy 600	Hydrocarbon film
Carbon Steel (except weld bodies)	Zinc plating
Carbon Steel (welded bodies)	Hydrocarbon film Chemical conversion coating
Titanium	Anodized
Brass, Nylon, 316 Stainless Steel, and PTFE	Not applicable

- Over 1 in. and over 25 mm stainless steel fittings use stainless steel ferrules with PFA coating. Applications above 450°F (232°C) **require** silver-plated front ferrules and uncoated back ferrules. To order fittings with silver-plated ferrules, add **-BM** as a suffix to the basic ordering number.
- All carbon steel Swagelok tube fittings are supplied with 316 stainless steel back ferrules.

Pressure Ratings and Tubing Information

Swagelok Tube Fitting Pressure Ratings

Swagelok tube fittings are rated to the working pressure of tubing as listed in the *Swagelok Tubing Data* catalog. Careful selection of high-quality tubing is important when installing safe, leak-tight systems.

Pipe End Pressure Ratings

Pressure ratings for fittings that have both tube fitting and pipe thread ends are determined by the end connection with the lowest pressure rating. The **Pipe End Pressure Ratings** chart lists pressure ratings for male and female **pipe thread ends.** For female and male pipe threads to have the same pressure rating in the same nominal pipe size, the female thread would require a heavier wall, resulting in a fitting too large and bulky to be practical.

Stress values based on ASME B31.3 Code for Process Piping

Material	Allowable Stress Value		Design Factor	Ultimate Tensile Strength	
	psi	bar		psi	bar
316 SS	20 000	1378	3.75:1	75 000	5170
Brass	10 000	689	4:1	40 000	2760
Steel	20 000	1378	3:1	60 000	4140

Calculations based on ASME B31.3 code for Process Piping

NPT/ISO Pipe Size in.	316 SS and Carbon Steel				Brass			
	Male		Female		Male		Female	
	psig	bar	psig	bar	psig	bar	psig	bar
1/16	11 000	760	6700	460	5500	380	3300	230
1/8	10 000	690	6500	440	5000	340	3200	220
1/4	8000	550	6600	450	4000	270	3300	220
3/8	7800	540	5300	360	3900	270	2600	180
1/2	7700	530	4900	330	3800	260	2400	160
3/4	7300	500	4600	320	3600	250	2300	160
1	5300	370	4400	300	2600	180	2200	150
1 1/4	6000	410	5000	350	3000	200	2500	170
1 1/2	5000	340	4600	310	2500	170	2300	150
2	3900	270	3900	270	1900	130	1900	130

To determine working pressure ratings in accordance with ASME B31.1 Power Piping for 316 stainless steel, multiply psig by 0.94; for carbon steel, multiply psig by 0.75. Brass ratings remain the same. To determine working kPa, multiply psig by 6.89.

SAE/MS Pressure Ratings

Pressure ratings are from SAE J1926/3.

SAE/MS Thread Size	316 SS and Carbon Steel			
	(Nonpositionable)		(Positionable)	
	psig	bar	psig	bar
5/16-24	4568	315	4568	315
7/16-20				
1/2-20				
9/16-18			3626	250
3/4-16				
7/8-14	3626	250	2900	200
1 1/16-12				
1 3/16-12	2900	200	2320	160
1 5/16-12				
1 5/8-12	2320	160	1813	125
1 7/8-12				
2 1/2-12	1813	125	1450	100

O-Seal Pressure Ratings

O-seal fittings are rated to 3000 psig (206 bar).

NOTE: Some fittings with AN, O-Seal, and SAE/MS ends may have lower ratings. For more information, contact your independent Swagelok sales and service representative.

Thread Specifications

Thread Type	Reference Specification
NPT	ASME B1.20.1, SAE AS71051
ISO/BSP (parallel) (Based on DIN 3852)	ISO 228, BS 2779 JIS B 0202
ISO/BSP (tapered) (Based on DIN 3852)	ISO 7, BS 21 JIS B 0203
ISO/BSP (gauge) (Based on EN 837-1 and 837-3)	ISO 228, BS 2779
Unified (SAE)	ASME B1.1

Pipe Thread Sealants

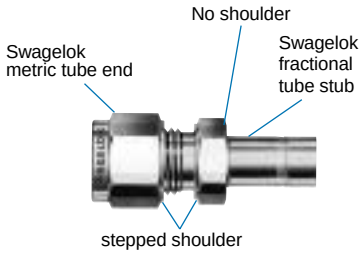
A thread sealant should always be used when assembling tapered threads. SWAK® anaerobic pipe thread sealant and PTFE tape are available through your independent Swagelok sales and service representative. For more information, see Lubricants/Sealants in your Swagelok product binder.

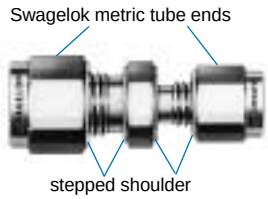
1 1/4 in. (28 mm) and Larger Swagelok Tube Fittings

A hydraulic swaging unit must be used when installing 1 1/4, 1 1/2, 2 in., 28, 30, 32, 38, and 50 mm Swagelok tube fittings. The unit is designed to swage the ferrules on the tubing prior to the final assembly into a fitting. See page 53 for complete information.

Identifying Metric Swagelok Tube Fittings

All metric tube fittings have a stepped shoulder on the body hex. Shaped fittings, such as elbows, crosses, and tees, are stamped *MM* for metric tubing, and have no step on forging.





Cleaning

Fitting components are cleaned to remove machine oil, grease, and loose particles. For more information, see Swagelok Specification SC-10.

Interchangeability

Other tube fitting manufacturers often claim that their components are interchangeable with Swagelok tube fitting components.

We believe that interchanging and intermixing tube fitting components of different designs, made by different manufacturers, can result in leaks and tube slippage in a percentage of cases. We also believe this practice can be dangerous in critical applications.

Leak-tight seals that will withstand high pressure, vibration, vacuum, and temperature changes depend upon close tolerances and consistent, exacting quality control in conjunction with good design principles.

The full value we build into Swagelok tube fittings is lost when components from other manufacturers are interchanged or intermixed with ours. We believe that ***any*** manufacturer's fitting performs best when only that manufacturer's components are used in its fittings.

We do not believe that a tube fitting made up by interchanging and intermixing components of other manufacturers with genuine Swagelok tube fitting components will perform to the high standards of an all-Swagelok tube fitting.

Safety Precautions

- Do not bleed system by loosening fitting nut or fitting plug.
- Do not make up and tighten fittings when system is pressurized.
- Make sure that the tubing rests firmly on the shoulder of the tube fitting body before tightening the nut.
- Use Swagelok gap inspection gauge to ensure sufficient pull-up upon initial installation.
- Never allow problems to go unreported.
- Always use proper thread sealants on tapered pipe threads.
- Do not mix materials or fitting components from various manufacturers—tubing, ferrules, nuts, and fitting bodies.
- Never turn fitting body. Instead, hold fitting body and turn nut.
- Avoid unnecessary disassembly of unused fittings.
- Use only long reducers in female Swagelok ports.
- Additional tubing considerations:
  1. Metal tubing material should be softer than fitting material. For example, stainless steel tubing should not be used with brass fittings.
  2. When tubing and fittings are made of the same material, tubing must be fully annealed.
  3. Always use an insert with extremely soft or pliable plastic tubing.
  4. Extremes of wall thickness should always be checked against fitting manufacturer's suggested minimum and maximum wall thickness limitations.
  5. Surface finish is very important to proper sealing. Tubing with any kind of depression, scratch, raised portion, or other surface defect will be difficult to seal, particularly in gas service.
  6. Tubing that is oval and will not easily fit through fitting nuts, ferrules, and bodies should never be forced into the fitting.

Item 26

Check Valves

C, CA, CH, CP, and CPA Series

- Working pressures up to 6000 psig (413 bar)
- Adjustable and fixed cracking pressures
- Variety of end connections
- 316 stainless steel and brass materials

Swagelok

Technical Data

Cracking pressure—the upstream pressure at which the first indication of flow occurs.

Reseal pressure—the pressure at which there is no indication of flow.

⚠ **For valves not actuated for a period of time, initial cracking pressure may be higher than the set cracking pressure.**

Series	Maximum Flow Coefficient (C_v)	Nominal Cracking Pressure psi (bar)	Downstream Pressure at 70°F (20°C) psig (bar)
Fixed Cracking Pressure			
2C	0.10	1/3, 1, 10 and 25 (0.03, 0.07, 0.69, and 1.8)	1000 (68.9)①
4C	0.47		
6C	1.47		200 (13.7)
8C	1.68		
12C, 16C	4.48		
CH4	0.67	1/3, 1, 5, 10 and 25 (0.03, 0.07, 0.35 0.69, and 1.8)	6000 (413)
CH8	1.8		
CH16	4.7		5000 (344)
4CP	0.35	1/3, 1, 10 and 25 (0.03, 0.07, 0.69, and 1.8)	3000 (206)
8CP	1.20		
Adjustable Cracking Pressure			
CA	0.37	3 to 50 (0.21 to 3.5) 50 to 150 (3.5 to 10.4) 150 to 350 (10.4 to 24.2) 350 to 600 (24.2 to 41.4)	3000 (206)
4CPA	0.35		
8CPA	1.20		

① For cracking pressure of 25 psi (1.8 bar), downstream pressure is 3000 psig (206 bar).

Pressure-Temperature Ratings

C (2C, 4C, 6C, and 8C), CA, CP, and CPA Series

Ratings based on fluorocarbon FKM O-rings in 316 stainless steel valves and Buna N O-rings in brass valves.

Material	316 SS	Brass
Temperature, °F (°C)	**Working Pressure,** psig (bar)①	
–10 (–23) to 100 (37)	3000 (206)	3000 (206)
200 (93)	2575 (177)	2600 (179)
250 (121)	2450 (168)	2405 (165)
300 (148)	2325 (160)	—
375 (190)	2185 (150)	—

① To reduce the possibility of dislodging the O-ring in systems where pressure surges, shock, or pulses occur, for all 2C and 4C series valves and for 6C and 8C series valves with cracking pressures lower than 50 psi (3.5 bar), an optional inlet gasket is available. See page 14 for ordering information. Cracking and reseal pressures may decrease slightly from the ranges listed in this catalog.

Alternatively, CH or CP series valves should be considered.

C Series (12C and 16C)

Ratings based on fluorocarbon FKM O-rings in 316 stainless steel valves and Buna N O-rings in brass valves.

Material	316 SS	Brass
Temperature, °F (°C)	**Working Pressure,** psig (bar)	
–10 (–23) to 100 (37)	2000 (137)	1500 (103)
200 (93)	1715 (118)	1300 (89.5)
250 (121)	1630 (112)	1200 (82.6)
300 (148)	1545 (106)	—
375 (190)	1450 (99.9)	—

CH Series

Ratings based on fluorocarbon FKM seals.

Material	316 SS	
Series	**CH4, CH8**	**CH16**
Temperature, °F (°C)	**Working Pressure,** psig (bar)	
–10 (–23) to 100 (37)	6000 (413)	5000 (344)①
200 (93)	5160 (355)	4290 (295)
250 (121)	4910 (338)	4080 (281)
300 (148)	4660 (321)	3875 (266)
400 (204)	4280 (294)	3560 (245)

For more information about pressure ratings of valves with tube fitting end connections, see Swagelok® *Tubing Data*, MS-01-107.

① Pressure ratings may be limited by the end connection. See **Dimensions**, page 12.

Cracking and Reseal Pressures at 70°F (20°C)

Cracking pressure—the upstream pressure at which the first indication of flow occurs.

Reseal pressure—the pressure at which there is no indication of flow.

⚠ **For valves not actuated for a period of time, initial cracking pressure may be higher than the set cracking pressure.**

C Series

Nominal Cracking Pressure psi (bar)	Cracking Pressure Range psi (bar)	Reseal Pressure psi (bar)
1/3 (0.03)	Up to 3 (0.21)	Up to 6 (0.42) downstream pressure
1 (0.07)	Up to 4 (0.28)	Up to 6 (0.42) downstream pressure
10 (0.69)	7 to 15 (0.49 to 1.1)	3 (0.21) or more upstream pressure
25 (1.8)	20 to 30 (1.4 to 2.1)	17 (1.2) or more upstream pressure

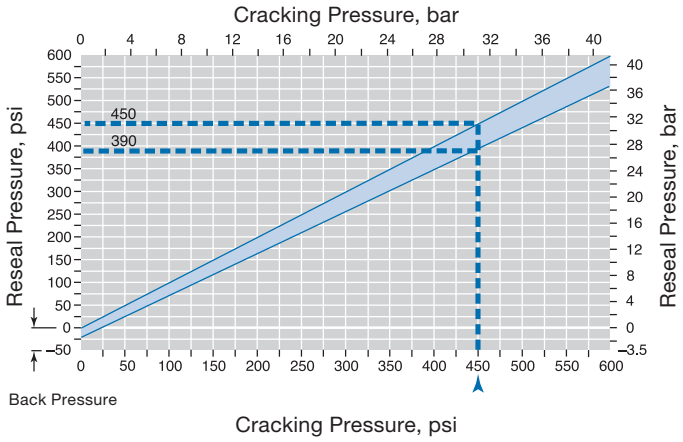
CH Series

Nominal Cracking Pressure psi (bar)	Cracking Pressure Range psi (bar)	Reseal Pressure psi (bar)
1/3 (0.03)	Up to 3 (0.21)	Up to 6 (0.42) back pressure
1 (0.07)	Up to 4 (0.28)	Up to 5 (0.35) back pressure
5 (0.35)	3 to 9 (0.21 to 0.63)	Up to 2 (0.14) back pressure
10 (0.69)	7 to 15 (0.49 to 1.1)	3 (0.21) or more upstream pressure
25 (1.8)	20 to 30 (1.4 to 2.1)	17 (1.2) or more upstream pressure

CP Series

Nominal Cracking Pressure psi (bar)	Cracking Pressure Range psi (bar)	Reseal Pressure psi (bar)
1/3 (0.03)	Up to 3 (0.21)	6 to 20 (0.42 to 1.4) downstream pressure
1 (0.07)	Up to 4 (0.28)	5 to 20 (0.35 to 1.4) downstream pressure
10 (0.69)	7 to 13 (0.49 to 0.90)	3 to 10 (0.21 to 0.69) downstream pressure
25 (1.8)	21 to 29 (1.5 to 2.0)	5 (0.35) or more upstream pressure

CA and CPA Series

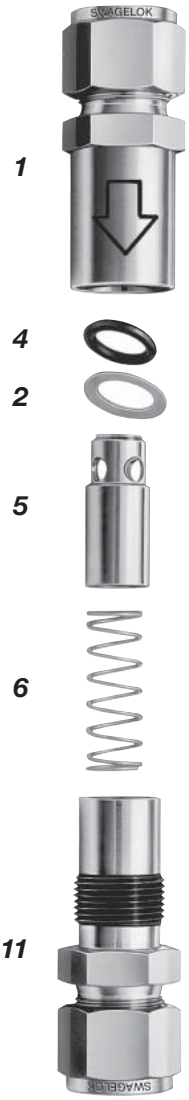


Materials of Construction

C and CA Series

Component	Valve Body Materials	
	316 SS	Brass
	Material Grade/ASTM Specification	
1 *Inlet body*	*316 SS/A479*	*Brass 360/B16*
2 *Inlet gasket (CA series)*	*PTFE-coated 316 SS/A240*	
Inlet gasket (standard for 6C and 8C series with ≥ 50 psi [3.5 bar] spring; optional for 2C and 4C series and all other 6C and 8C series)	*PTFE-coated 316 SS/A240*	
Inlet gasket (12C and 16C series)	*PTFE-coated 316 SS/A240*	*PTFE-coated aluminum/B209*
3 *Insert (CA series)*	*316 SS/A479*	*Naval brass 485/B21*
4 *O-ring*	*Fluorocarbon FKM*	*Buna N*
5 *Poppet*	*316 SS/A479*	*Brass 360/B16*
6 *Spring*	*302 SS/A313*	
7 *Center body (CA series)*	*316 SS/A479*	*Brass 360/B16*
8 *Adjusting screw (CA series)*	*316 SS/A276*	
9 *Locking screw (CA series)*		
10 *Outlet gasket (CA series)*	*PTFE-coated 316 SS/A240*	
11 *Outlet body*	*316 SS/A479*	*Brass 360/B16*
Lubricants	*Silicone-based and molybdenum disulfide-based (C series); PTFE-based and molybdenum disulfide-based (CA series)*	*Silicone-based (C series); PTFE-based (CA series)*

Wetted components listed in *italics*.



12C Series shown

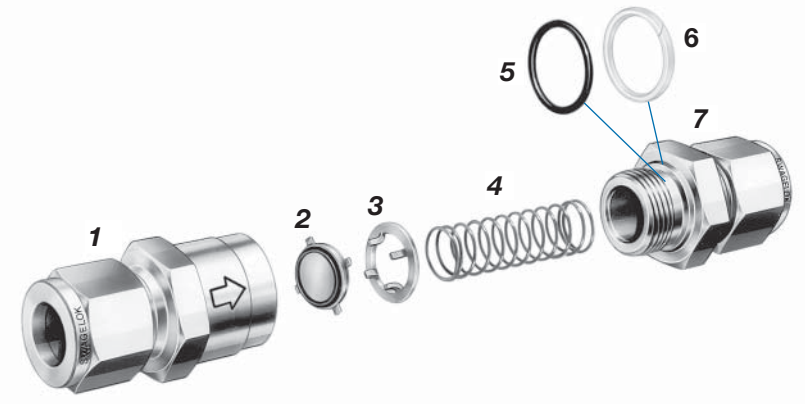
CA Series

CH Series

Component	Material Grade/ ASTM Specification
1 *Inlet body*	*316 SS/A479*
2 *Poppet*	*Fluorocarbon FKM-bonded① 316 SS/A479*
3 *Poppet stop*	*316 SS/A240*
4 *Spring*	*302 SS/A313*
5 *O-ring*	*Fluorocarbon FKM*
6 Backup ring	PTFE/D1710
7 *Outlet body*	*316 SS/A479*
Lubricant	*PTFE-based*

Wetted components listed in *italics*.

① Material Safety Data Sheet for bonding agent available on request.



Flow Data at 70°F (20°C)

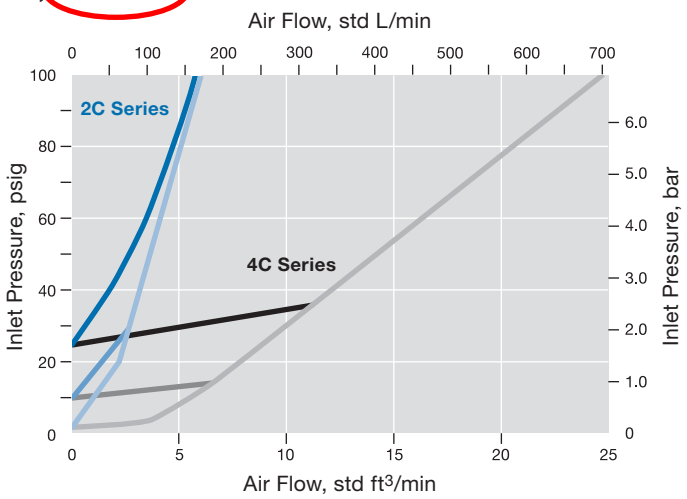
C Series

Nominal Cracking Pressures

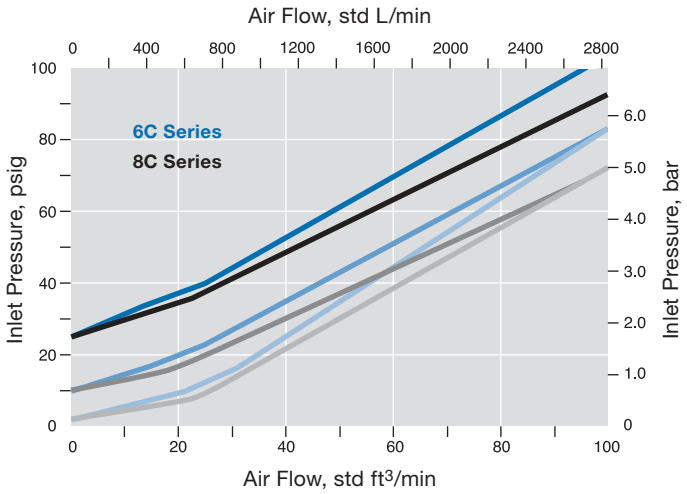
2C, 6C, 16C Series	1 psi (0.07 bar)	10 psi (0.69 bar)	25 psi (1.8 bar)
4C, 8C Series	1 psi (0.07 bar)	10 psi (0.69 bar)	25 psi (1.8 bar)

Air

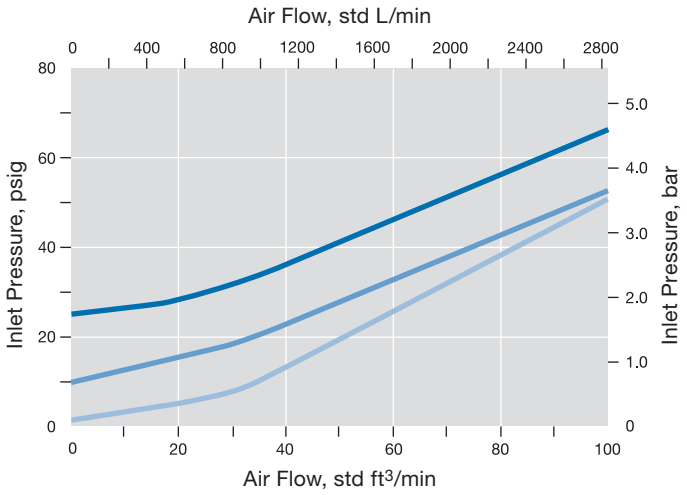
2C, 4C Series



6C, 8C Series

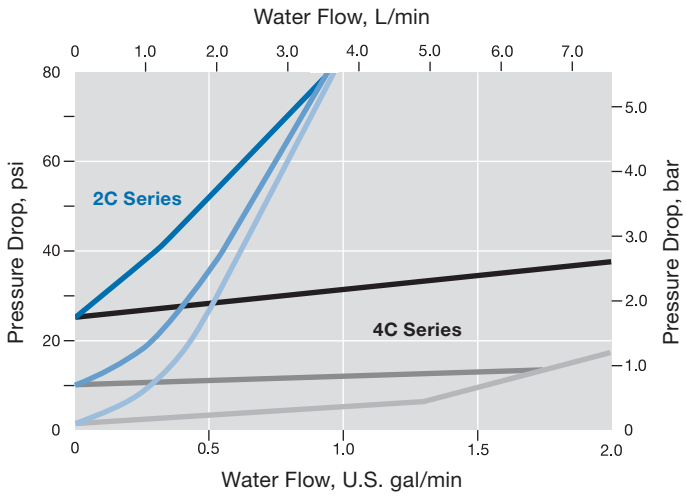


16C Series

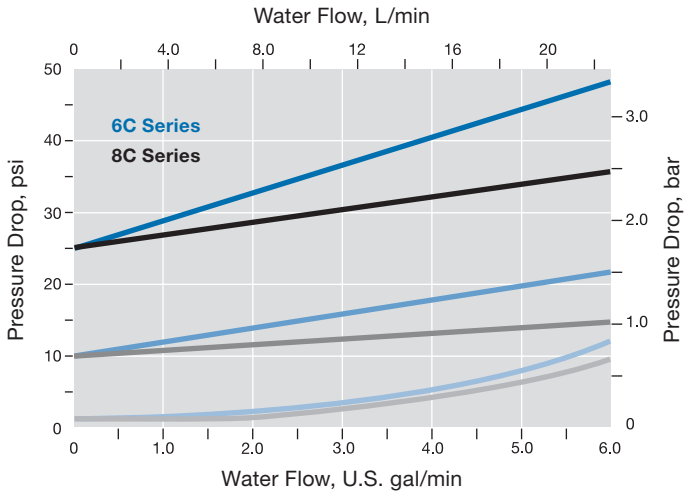


Water

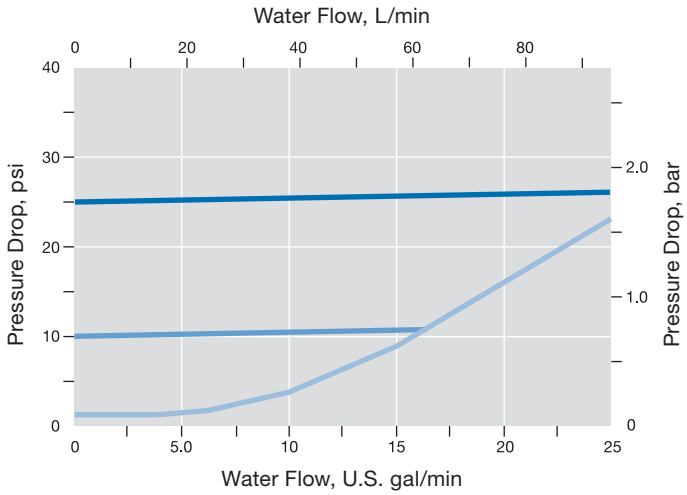
2C, 4C Series



6C, 8C Series



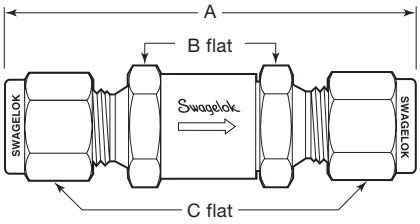
16C Series



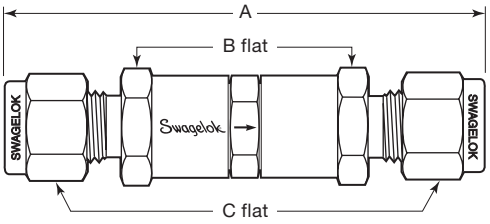
Dimensions

Dimensions, shown with Swagelok tube fitting nuts finger-tight, are for reference only and are subject to change.

C Series



CA Series



End Connections		Basic Ordering Number	Series	Dimensions, in. (mm)		
Inlet/Outlet	Size			A	B	C
Fixed Cracking Pressure, C Series						
Fractional Swagelok tube fittings	1/8 in.	SS-2C-	2C	2.14 (54.3)	5/8	7/16
	1/4 in.	SS-4C-	4C	2.35 (59.7)		9/16
	3/8 in.	SS-6C-	6C	3.17 (80.5)	7/8	11/16
	1/2 in.	SS-8C-	8C	3.42 (86.9)		7/8
	3/4 in.	SS-12C-	12C	4.32 (110)	1 1/4	1 1/8
	1 in.	SS-16C-	16C	4.74 (120)	1 3/8	1 1/2
Metric Swagelok tube fittings	6 mm	SS-6C-MM-	4C	2.36 (59.9)	5/8	(14)
	10 mm	SS-10C-MM-	8C	3.32 (84.3)	7/8	(19)
	12 mm	SS-12C-MM-		3.42 (86.9)		(22)
Female NPT	1/8 in.	SS-2C4-	2C	1.89 (48.0)	5/8	—
	1/4 in.	SS-4C4-	4C	2.15 (54.6)	3/4	
	3/8 in.	SS-6C4-	6C	2.98 (75.7)	7/8	
	1/2 in.	SS-8C4-	8C	3.58 (90.9)	1 1/16	
	3/4 in.	SS-12C4-	12C	4.08 (104)	1 1/4	
	1 in.	SS-16C4-	16C	4.84 (123)	1 5/8	
Male NPT	1/8 in.	SS-2C2-	2C	1.71 (43.4)	5/8	
	1/4 in.	SS-4C2-	4C	2.09 (53.1)		
	3/8 in.	SS-6C2-	6C	2.78 (70.6)	7/8	
	1/2 in.	SS-8C2-	8C	3.16 (80.3)		
	3/4 in.	SS-12C2-	12C	4.08 (104)	1 1/4	
	1 in.	SS-16C2-	16C	4.52 (115)	1 5/8	
Male NPT/ Swagelok tube fitting	1/4 in.	SS-4C1-	4C	2.22 (56.4)	5/8	9/16
Male VCR fittings	1/4 in.	SS-4C-VCR-	4C	2.21 (56.1)	5/8	—
	1/2 in.	SS-8C-VCR-	8C	3.56 (90.4)	15/16	
	3/4 in.	SS-12C-VCR-	12C	4.64 (118)	1 5/8	
	1 in.	SS-16C-VCR-	16C	4.76 (121)		
Adjustable Cracking Pressure, CA Series						
Swagelok tube fittings	1/4 in.	SS-4CA-	CA	3.23 (82.0)	5/8	9/16
	6 mm	SS-6CA-MM-				(14)
	8 mm	SS-8CA-MM-		3.32 (84.3)		(16)
Male NPT/ Swagelok tube fitting	1/4 in.	SS-4CA1-		3.12 (79.2)		9/16
Male VCR fittings	1/4 in.	SS-4CA-VCR-		3.09 (78.5)		—

Ordering Information

Basic ordering numbers specify stainless steel material. To order brass, replace **SS** with **B** in the basic ordering number.

Example: **B**-2C-

C Series

To order, add a cracking pressure designator to the basic ordering number.

Cracking Pressure psi (bar)	Designator
1/3 (0.03)	1/3
1 (0.07)	1
10 (0.69)	10
25 (1.8)	25

Example: SS-2C-**1/3**

CA Series

To order, add a cracking pressure range designator to the basic ordering number.

Cracking Pressure psi (bar)	Designator
3 to 50 (0.21 to 3.5)	3
50 to 150 (3.5 to 10.4)	50
150 to 350 (10.4 to 24.2)	150
350 to 600 (24.2 to 41.4)	350

Example: SS-4CA-**3**

⚠ **Check valves are designed for directional flow control only. Swagelok check valves should never be used as code safety relief devices.**

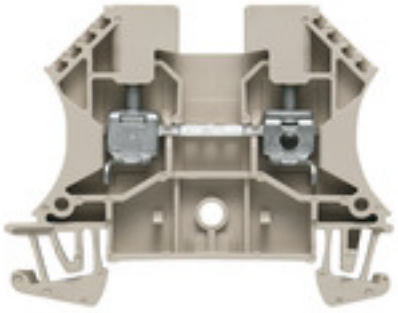
Item 33

WDU 4

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 26
D-32758 Detmold
Germany

www.weidmueller.com

Product image



Klippon® Connect with clamping yoke Technology
The high reliability and variety of designs of the terminal blocks with clamping yoke connections make planning easer and optimises operational safety. Klippon® Connect provides a proven response to a range of different requirements.

General ordering data

Version	Feed-through terminal, Screw connection, 4 mm², 800 V, 32 A, dark beige
Order No.	1020100000
Type	WDU 4
GTIN (EAN)	4008190150617
Qty.	100 pc(s).

WDU 4

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 26
D-32758 Detmold
Germany

www.weidmueller.com

Technical data

Dimensions and weights

Depth	46.5 mm	Depth (inches)	1.831 inch
Depth including DIN rail	47 mm	Height	60 mm
Height (inches)	2.362 inch	Width	6.1 mm
Width (inches)	0.24 inch	Weight	9 g
Net weight	9.57 g		

Temperatures

Storage temperature	-25 °C...55 °C	Operating temperature range	For operating temperature range see EC Design Test Certificate / IEC Ex-Certificate of Conformity
Continuous operating temp., min.	-60 °C	Continuous operating temp., max.	130 °C

Material data

Material	Wemid	Colour	dark beige
UL 94 flammability rating	V-0		

Rating data IECEx/ATEX

Certificate No. (ATEX)	DEMKO14ATEX1338U	Certificate No. (IECEX)	IECEXULD14.0005U
Max. voltage (ATEX)	690 V	Current (ATEX)	32 A
Wire cross section max. (ATEX)	4 mm²	Max. voltage (IECEX)	690 V
Current (IECEX)	32 A	Wire cross section max. (IECEX)	4 mm²
Operating temperature range	For operating temperature range see EC Design Test Certificate / IEC Ex-Certificate of Conformity	Marking EN 60079-7	Ex eb II C Gb
Ex 2014/34/EU label	II 2 G D		

System specifications

Version	Screw connection, for plug-in cross-connector, for screwable cross-connection, One end without connector	End cover plate required	Yes
Number of potentials	1	Number of levels	1
Number of clamping points per level	2	Number of potentials per tier	1
Levels cross-connected internally	No	PE connection	No
Rail	TS 35	N-function	No
PE function	No	PEN function	No

2 clampable conductors (H05V/H07V) with equal cross-section (rated connection)

Cross-section for connected wire, solid, two clampable wires, max.	2.5 mm²	Cross-section for connected wire, solid, two clampable wires, min.	0.5 mm²
Wire connection cross section, finely stranded with wire-end ferrules DIN 46228/1, 2 clampable wires, max.	1.5 mm²	Wire connection cross section, finely stranded with wire-end ferrules DIN 46228/1, 2 clampable wires, min.	0.5 mm²
Wire connection cross section, finely stranded, two clampable wires, min.	0.5 mm²	Wire cross-section, finely stranded, two clampable wires, max.	1.5 mm²

Weidmüller

WDU 4

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 26
D-32758 Detmold
Germany

www.weidmueller.com

Technical data

Additional technical data

Explosion-tested version	Yes	Number of similar terminals	1
Open sides	right	Type of mounting	Snap-on

CSA rating data

Certificate No. (CSA)	200039-1057876	Current size B (CSA)	35 A
Current size C (CSA)	35 A	Voltage size C (CSA)	600 V
Wire cross section max. (CSA)	10 AWG	Wire cross section min. (CSA)	26 AWG

Conductors for clamping (rated connection)

Blade size	0.6 x 3.5 mm			
Clampable conductor	Connection specification	Screw connection		
	Cross-section for conductor connection	Type	solid, H05(07) V-U	
		min.	0.5 mm²	
		max.	6 mm²	
		nominal	4 mm²	
	wire end ferrule	Stripping length	min.	10 mm
			max.	10 mm
			nominal	10 mm
		Tightening torque	min.	0.5 Nm
			max.	1 Nm
		Recommended wire-end ferrule		
	Connection specification	Screw connection		
	Cross-section for conductor connection	Type	stranded, H07V-R	
		min.	1.5 mm²	
		max.	6 mm²	
		nominal	4 mm²	
	wire end ferrule	Stripping length	min.	10 mm
			max.	10 mm
			nominal	10 mm
		Tightening torque	min.	0.5 Nm
			max.	1 Nm
		Recommended wire-end ferrule		
	Connection specification	Screw connection		
	Cross-section for conductor connection	Type	flexible, H05(07) V-K	
		min.	0.5 mm²	
		max.	6 mm²	
		nominal	4 mm²	
	wire end ferrule	Stripping length	min.	10 mm
			max.	10 mm
			nominal	10 mm
		Tightening torque	min.	0.5 Nm
			max.	1 Nm
		Recommended wire-end ferrule		
Clamping range, max.	6 mm²			
Clamping range, min.	0.13 mm²			
Clamping screw	M 3			
Connection cross-section, stranded, max.	6 mm²			
Connection cross-section, stranded, min.	1.5 mm²			
Connection direction	on side			

WDU 4

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Technical data

Gauge to IEC 60947-1	A4
Number of connections	2
Stripping length	10 mm
Tightening torque, max.	1 Nm
Tightening torque, min.	0.5 Nm
Torque level with DMS electric screwdriver	2
Twin wire-end ferrules, max.	2.5 mm²
Twin wire-end ferrules, min.	0.5 mm²
Type of connection	Screw connection
Wire connection cross section AWG, max.	AWG 10
Wire connection cross section AWG, min.	AWG 26
Wire connection cross section, finely stranded, max.	6 mm²
Wire connection cross section, finely stranded, min.	0.5 mm²
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/1, max.	4 mm²
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/1, min.	0.5 mm²
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/4, max.	4 mm²
Wire connection cross-section, finely stranded with wire-end ferrules DIN 46228/4, min.	0.5 mm²
Wire connection cross-section, solid core, max.	6 mm²
Wire connection cross-section, solid core, min.	0.5 mm²

General

Rail	TS 35	Standards	IEC 60947-7-1
Wire connection cross section AWG, max.	AWG 10	Wire connection cross section AWG, min.	AWG 26

Rating data

Rated cross-section	4 mm²	Rated voltage	800 V
Rated current	32 A	Current at maximum wires	41 A
Standards	IEC 60947-7-1	Volume resistance according to IEC 60947-7-x	1 mΩ
Rated impulse withstand voltage	8 kV	Power loss in accordance with IEC 60947-7-x	1.02 W
Pollution severity	3		

UL rating data

Certificate No. (UR)	E60693	Conductor size Factory wiring max. (UR)	10 AWG
Conductor size Factory wiring min. (UR)	26 AWG	Conductor size Field wiring max. (UR)	10 AWG
Conductor size Field wiring min. (UR)	22 AWG	Current size C (UR)	35 A
Voltage size C (UR)	600 V		

WDU 4

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Germany

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Technical data

Classifications

ETIM 6.0	EC000897	ETIM 7.0	EC000897
ETIM 8.0	EC000897	ECLASS 9.0	27-14-11-20
ECLASS 9.1	27-14-11-20	ECLASS 10.0	27-14-11-20
ECLASS 11.0	27-14-11-20		

Approvals

Approvals

ROHS	Conform
UL File Number Search	E60693

Downloads

Approval/Certificate/Document of Conformity	Attestation of Conformity IECEx Certificate CB Testreport CB Certificate EAC certificate DNVGL certificate NEMKO certificate INMETRO certificate Lloyds Register Certificate MARITREG Certificate POLSKIREJ certificate EAC EX Certificate CCC Ex Certificate CE Declaration of Conformity ATEX Certificate CE Declaration of Conformity all terminals
Engineering Data	CAD data – STEP
Engineering Data	EPLAN, WSCAD, Zuken E3.S
User Documentation	NTI WDU/WPE 4 StorageConditionsTerminalBlocks
Catalogues	Catalogues in PDF-format
Brochures	

WDU 4

Weidmüller Interface GmbH & Co. KG
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Germany

www.weidmueller.com

Drawings

General Accessories

Item 43

Stahlin enclosures are created in standard forms and shapes, but the ability to customize into unique end user configurations may be the single best reason to buy Stahlin products. Certain accessories are available by part number and can be added at the time of the enclosure purchase, or added later as a separate item.

By comparison, modifications are considerably more complex and end user specific and they must be implemented before the enclosure leaves the factory. All items listed as **Accessories** are available as separately priced items. All services designated **Modifications** must be requested at the time of order placement.

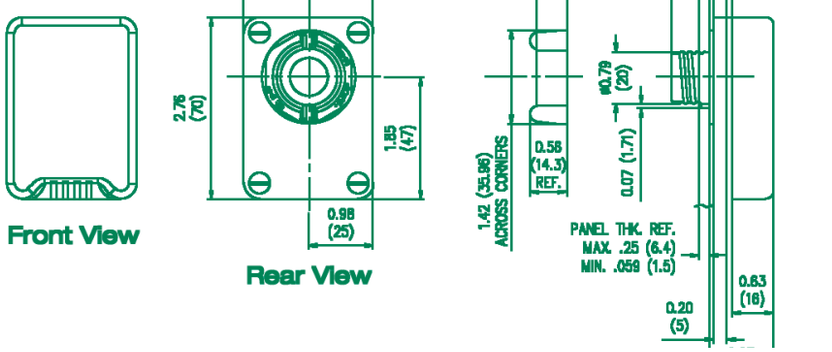
Breather Vent

BV4XKIT Breather Vent

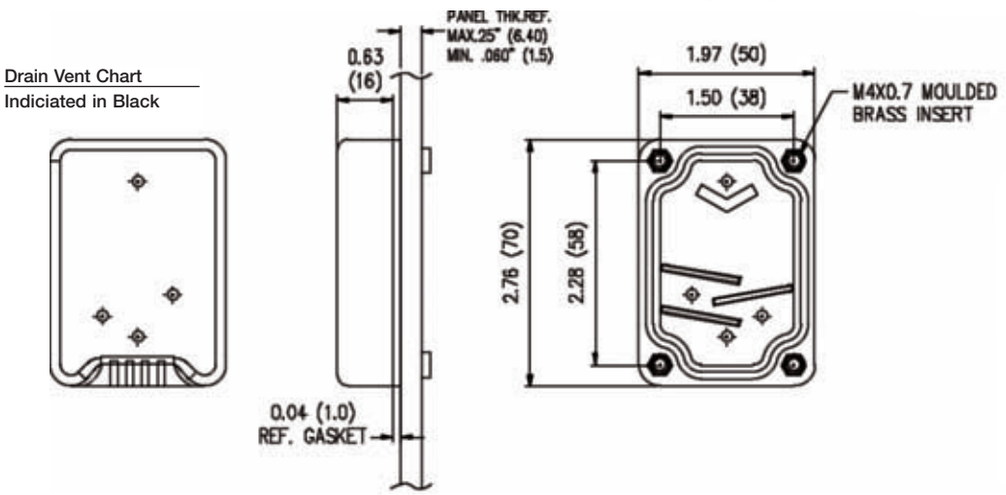
Stahlin's new non-metallic Breather Vent allows an enclosure to "breathe" — literally allowing the free passage of air while maintaining UL Type 4x enclosure integrity as a recognized component.

MODEL NUMBER	UPC CODES
BV4XKIT	80021

Breather Vent Chart
Indiciated in GREEN



Drain Vent Chart
Indiciated in Black



Item 49

RH Series Compact Power Relays

Key features

- SPDT through 4PDT, 10A contacts
- Compact power type relays
- Miniature power relays with a large capacity
- 10A contact capacity
- Compact size saves space

Part Number Selection

Contact	Model	Part Number: Blade Terminal	Part Number: PCB Terminal	Coil Voltage Code (Standard Stock in bold)
SPDT 	Standard	RH1B-U □	RH1V2-U □	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, ~~**DC12V**~~, ~~**DC24V**~~, DC48V, DC110V
	With Indicator	RH1B-UL □	—	
	With Check Button	RH1B-UC □	—	
	With Indicator and Check Button	RH1B-ULC □	—	
	Top Bracket Mounting	RH1B-UT □	—	
	With Diode (DC coil only)	RH1B-UD □	RH1V2-UD □	DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH1B-ULD □	—	**DC12V**, **DC24V**, DC48V, DC110V
DPDT 	Standard	RH2B-U □	RH2V2-U □	AC6V, AC12V, **AC24V**, **AC110-120V**, **AC220-240V** DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V
	With Indicator	RH2B-UL □	RH2V2-UL □	
	With Check Button	RH2B-UC □	—	
	With Indicator and Check Button	RH2B-ULC □	—	
	Top Bracket Mounting	RH2B-UT □	—	
	With Diode (DC coil only)	RH2B-UD □	RH2V2-UD □	DC6V, **DC12V**, **DC24V**, DC48V, DC100-110V
	With Indicator and Diode (DC coil only)	RH2B-ULD □	RH2V2-ULD □	
3PDT 	Standard	RH3B-U □	RH3V2-U □	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator	RH3B-UL □	RH3V2-UL □	
	With Check Button	RH3B-UC □	—	
	With Indicator and Check Button	RH3B-ULC □	—	
	Top Bracket Mounting	RH3B-UT □	—	
	With Diode (DC coil only)	RH3B-UD □	—	DC6V, DC12V, DC24V, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH3B-ULD □	—	
4PDT 	Standard	RH4B-U □	RH4V2-U □	AC6V, AC12V, **AC24V**, AC110V, **AC120V**, AC220V, **AC240V** DC6V, **DC12V**, **DC24V**, DC48V, DC110V
	With Indicator	RH4B-UL □	RH4V2-UL □	
	With Check Button	RH4B-UC □	—	
	With Indicator and Check Button	RH4B-ULC □	—	
	Top Bracket Mounting	RH4B-UT □	—	
	With Diode (DC coil only)	RH4B-UD □	RH4V2-UD □	DC6V, DC12V, DC24V, DC48V, DC110V
	With Indicator and Diode (DC coil only)	RH4B-ULD □	—	

PCB terminal relays are designed to mount directly to a circuit board without any socket.

Ordering Information
When ordering, specify the Part No. and coil voltage code:
(example) **RH3B-U** (Part No.) **AC120V** (Coil Voltage Code)

Sockets (for Blade Terminal Models)

Relays	Standard DIN Rail Mount [1]	Finger-safe DIN Rail Mount [1]	Through Panel Mount	PCB Mount
RH1B	SH1B-05	SH1B-05C	SH1B-51	SH1B-62
RH2B	SH2B-05	SH2B-05C	SH2B-51	SH2B-62
RH3B	SH3B-05	SH3B-05C	SH3B-51	SH3B-62
RH4B	SH4B-05	SH4B-05C	SH4B-51	SH4B-62
				

1. DIN Rail mount socket comes with two horseshoe clips. Do not use unless you plan to insert pullover wire spring. Replacement horseshoe clip part number is Y778-011.

Hold Down Springs & Clips

Appearance	Item	Relay	For DIN Mount Socket	For Through Panel & PCB Mount Socket
	Pullover Wire Spring	RH1B	SY2S-02F1 [2]	SY4S-51F1
		RH2B	SY4S-02F1 [2]	
		RH3B	SH3B-05F1 [2]	
		RH4B	SH4B-02F1 [2]	
	Leaf Spring (side latch)	RH1B, RH2B, RH3B, RH4B	SFA-202 [3]	SFA-302 [3]
	Leaf Spring (top latch)	RH1B, RH2B, RH3B, RH4B	SFA-101 [3]	SFA-301 [3]

2. Must use horseshoe clip when mounting in DIN mount socket. Replacement horseshoe clip part number is Y778-011.
3. Two required per relay.

AC Coil Ratings

Voltage (V)	Rated Current (mA) ±15% at 20°C								Coil Resistance (Ω) ±10% at 20°C				Operation Characteristics (against rated values at 20°C)		
	AC 50Hz				AC 60Hz										
	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	Max. Continuous Applied Voltage	Pickup Voltage	Dropout Voltage
6	170	240	330	387	150	200	280	330	330	9.4	6.4	5.4	110%	80% maximum	30% minimum
12	86	121	165	196	75	100	140	165	165	39.3	25.3	21.2			
24	42	60.5	81	98	37	50	70	83	83	153	103	84.5			
110	9.6	—	18.1	21.6	8.4	—	15.5	18.2	18.2	—	2,200	1,800			
110-120	—	9.4-10.8	—	—	—	8.0-9.2	—	—	—	—	—	—			
120	8.6	—	16.4	19.5	7.5	—	14.2	16.5	16.5	—	10,800	7,360			
220	4.7	—	8.8	10.7	4.1	—	7.7	9.1	9.1	—	10,800	7,360			
220-240	—	4.7-5.4	—	—	—	4.0-4.6	—		—	18,820	—	—			
240	4.9	—	8.2	9.8	4.3	—	7.1	8.3	8.3	—	12,100	9,120			

DC Coil Ratings

Voltage (V)	Rated Current (mA) ±15% at 20°C				Coil Resistance (Ω) ±10% at 20°C				Operation Characteristics (against rated values at 20°C)		
	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	Max. Continuous Applied Voltage	Pickup Voltage	Dropout Voltage
6	128	150	240	250	47	40	25	24	110%	80% maximum	10% minimum
12	64	75	120	125	188	160	100	96			
24	32	36.9	60	62	750	650	400	388			
48	18	18.5	30	31	2,660	2,600	1,600	1,550			
100-110	—	8.2-9.0	—	—	—	12,250	—	—			
110	8	—	12.8	15	13,800	—	8,600	7,340			

Standard coil voltages are in **BOLD**.

Contact Ratings

Model	Continuous Current	Maximum Contact Capacity: Allowable Contact Power: Resistive Load	Allowable Contact Power: Inductive Load	Rated Load: Voltage (V)	Rated Load: Res. Load	Rated Load: Ind. Load
SPDT	10A	1540VA 300W	990VA 210W	110 AC	10A	7A
				220 AC	7A	4.5A
				30 DC	10A	7A
DPDT 3PDT 4PDT	10A	1650VA 300W	1100VA 225W	110 AC	10A	7.5A
				220 AC	7.5A	5A
				30 DC	10A	7.5A

Note: Inductive load for the rated load — cos ø = 0.3, L/R = 7 ms

TÜV Ratings

Voltage	RH1	RH2	RH3	RH4
240V AC	10A	10A	7.5A	7.5A
30V DC	10A	10A	10A	10A

AC: cos ø = 1.0, DC: L/R = 0 ms

UL Ratings

Voltage	Resistive: RH1 RH2	Resistive: RH3	Resistive: RH4	General Use: RH1 RH2	General Use: RH3	General Use: RH4	Horsepower Rating: RH1 RH2	Horsepower Rating: RH3	Horsepower Rating: RH4
240V AC	10A	7.5A	7.5A	7A	6.5A	5A	1/3 HP	1/3 HP	—
120V AC	—	10A	10A	—	7.5A	7.5A	1/6 HP	1/6 HP	—
30V DC	10A	10A	—	7A	—	—	—	—	—
28V DC	—	—	10A	—	—	—	—	—	—

CSA Ratings

Voltage	Resistive: RH1	Resistive: RH2	Resistive: RH3	Resistive: RH4	General Use: RH1	General Use: RH2	General Use: RH3	General Use: RH4	Horse-power Rating: RH1, 2, 3
240V AC	10A	10A	—	7.5A	7A	7A	7A	5A	1/3 HP
120V AC	10A	10A	10A	10A	7.5A	7.5A	—	7.5A	1/6 HP
30V DC	10A	10A	10A	10A	7A	7.5A	—	—	—

Socket Specifications

	Sockets	Terminal	Electrical Rating	Wire Size	Torque
DIN Rail Mount Sockets	SH1B-05	(Coil) M3 screws (contact) M3.5 screws with captive wire clamp	250V, 10A	Maximum up to 2–#12AWG	5.5 - 9 in•lbs 9 - 11.5 in•lbs
	SH2B-05 SH3B-05 SH4B-05	M3.5 screws with captive wire clamp	300V, 10A	Maximum up to 2–#12AWG	9 - 11.5 in•lbs
Finger-safe DIN Rail Mount	SH1B-05C	(coil) M3 screws (contact) M3.5 screws with captive wire clamp, fingersafe	250V, 10A	Maximum up to 2–#12AWG	5.5 - 9 in•lbs 9 - 11.5 in•lbs
	SH2B-05C SH3B-05C SH4B-05C	M3.5 screws with captive wire clamp, fingersafe	300V, 10A	Maximum up to 2–#12AWG	9 - 11.5 in•lbs
Through Panel Mount Socket	SH1B-51 SH2B-51 SH3B-51 SH4B-51	Solder	300V, 10A	—	—
PCB Mount Socket	SH1B-62	PCB mount	250V, 10A	—	—
	SH2B-62 SH3B-62 SH4B-62	PCB mount	300V, 10A	—	—

Accessories

Item	Appearance	Use with	Part No.	Remarks
Aluminum DIN Rail (1 meter length)		All DIN rail sockets	BNDN1000	The BNDN1000 is designed to accommodate DIN mount sockets. Made of durable extruded aluminum, the BNDN1000 measures 0.413 (10.5mm) in height and 1.37 (35mm) in width (DIN standard). Standard length is 39" (1,000mm).
DIN Rail End Stop		DIN rail	BNL5	9.1 mm wide.
Replacement Hold-Down Spring Anchor		DIN mount sockets and hold down springs.	Y778-011	For use on DIN rail mount socket when using pullover wire hold down spring. 2 pieces included with each socket.

Specifications

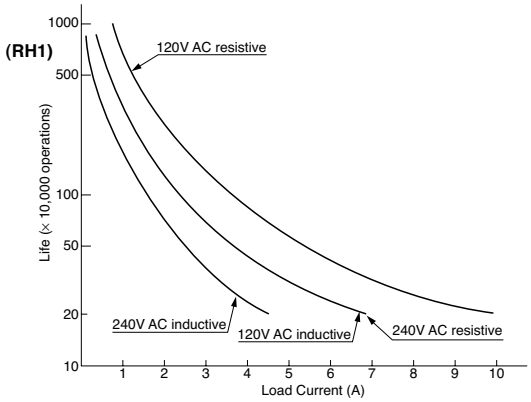
Contact Material		Silver cadmium oxide	
Contact Resistance [1]		50mΩ maximum	
Minimum Applicable Load		24V DC, 30 mA; 5V DC, 100 mA (reference value)	
Operating Time [2]	SPDT DPDT	20ms maximum	
	3PDT 4PDT	25ms maximum	
Release Time [2]	SPDT DPDT	20ms maximum	
	3PDT 4PDT	25ms maximum	
Power Consumption (approx.)	SPDT	AC: 1.1VA (50Hz), 1VA (60Hz)	DC: 0.8W
	DPDT	AC: 1.4VA (50Hz), 1.2VA (60Hz)	DC: 0.9W
	3PDT	AC: 2VA (50Hz), 1.7VA (60Hz)	DC: 1.5W
	4PDT	AC: 2.5VA (50Hz), 2VA (60Hz)	DC: 1.5W
Insulation Resistance		100MΩ minimum (500V DC megger)	
Dielectric Strength [3]	SPDT	Between live and dead parts: Between contact and coil: Between contacts of the same pole:	2,000V AC, 1 minute 2,000V AC, 1 minute 1,000V AC, 1 minute
	DPDT 3PDT 4PDT	Between live and dead parts: Between contact and coil: Between contacts of different poles: Between contacts of the same pole:	2,000V AC, 1 minute 2,000V AC, 1 minute 2,000V AC, 1 minute 1,000V AC, 1 minute
Operating Frequency		Electrical: Mechanical:	1,800 operations/hour maximum 18,000 operations/hour maximum
Vibration Resistance		Damage limits: Operating extremes:	10 to 55Hz, amplitude 0.5 mm 10 to 55Hz, amplitude 0.5 mm
Shock Resistance		Damage limits: Operating extremes:	1,000m/s^2 (100G) 200m/s^2 (20G - SPDT, DPDT) 100m/s^2 (10G - 3PDT, 4PDT)
Mechanical Life		50,000,000 operations minimum	
Electrical Life	DPDT	500,000 operations minimum (120V AC, 10A)	
	SPDT 3PDT 4PDT	200,000 operations minimum (120V AC, 10A)	
Operating Temperature [4]	SPDT DPDT 3PDT 4PDT	–25 to +70°C (no freezing)	
Operating Humidity		45 to 85% RH (no condensation)	
Weight (approx.)		SPDT: 24g, DPDT: 37g, 3PDT: 50g, 4PDT: 74g	

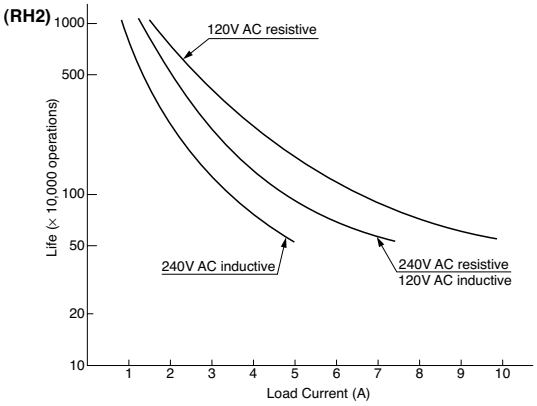
Note: Above values are initial values.
1. Measured using 5V DC, 1A voltage drop method
2. Measured at the rated voltage (at 20°C), excluding contact bouncing
   Release time of relays with diode: 40 ms maximum
3. Relays with indicator or diode: 1000V AC, 1 minute
4. For use under different temperature conditions, refer to Continuous Load Current vs. Operating Temperature Curve. The operating temperature range of relays with indicator or diode is –25 to +40°C.

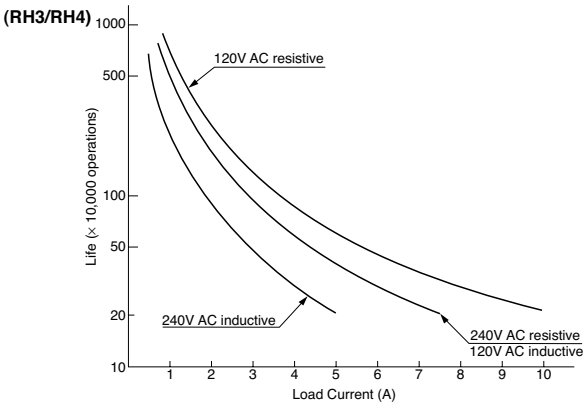
Characteristics (Reference Data)

Electrical Life Curves

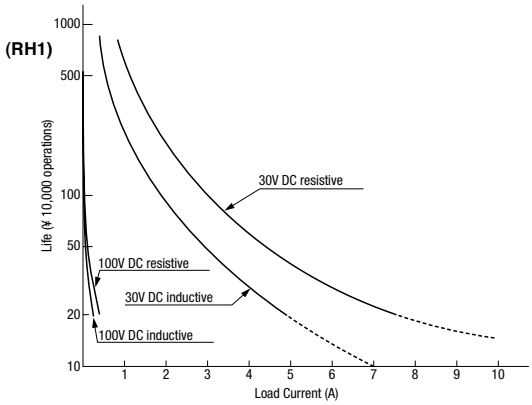
AC Load

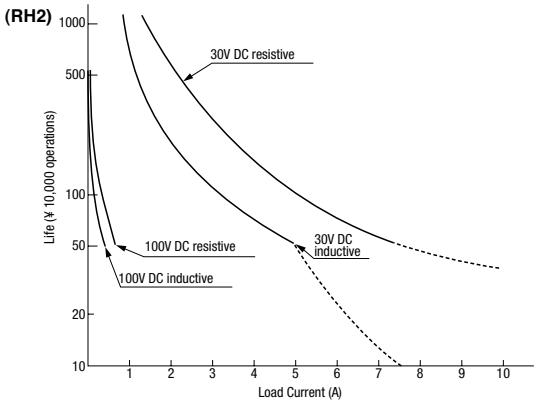


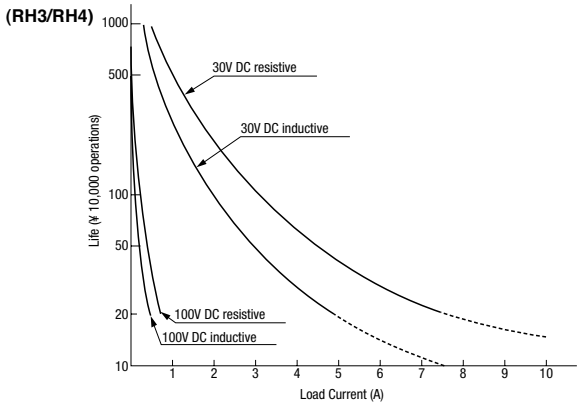




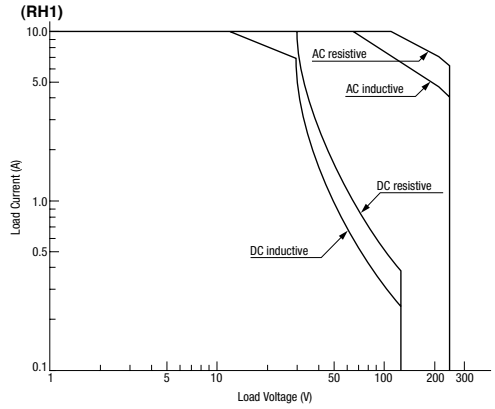
DC Load

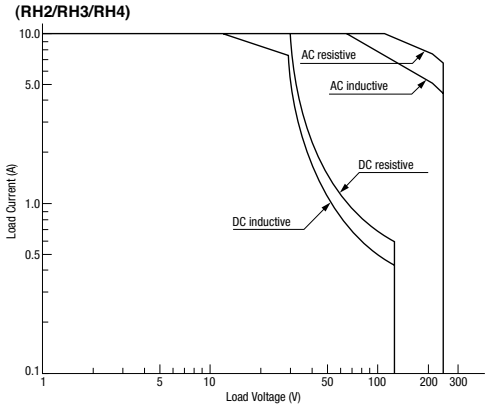






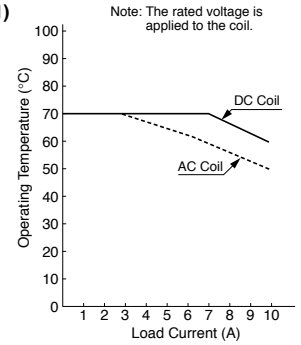
Maximum Switching Capacity



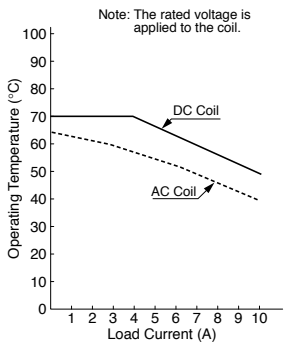


Continuous Load Current vs. Operating Temperature Curve (Basic Type, With Check Button, and Top Bracket Mounting Type)

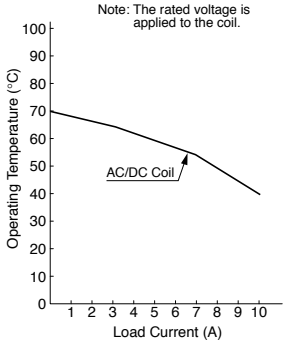
(RH1)



(RH2)



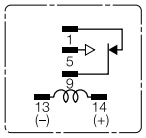
(RH3/RH4)



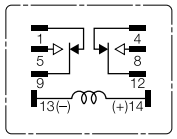
Internal Connection (View from Bottom)

Basic Type

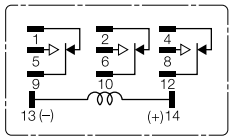
SPDT



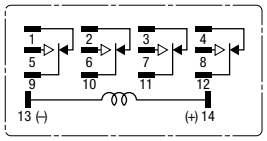
DPDT



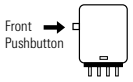
3PDT



4PDT

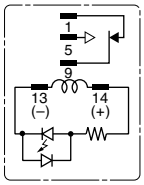
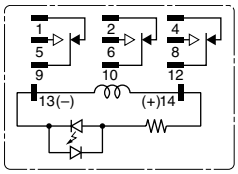
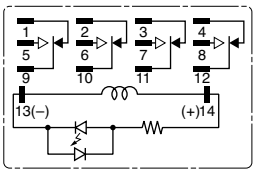
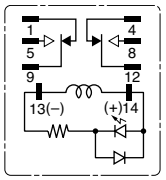
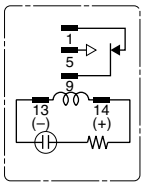
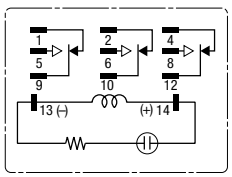
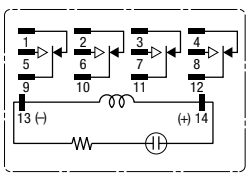
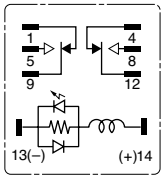


With Check Button



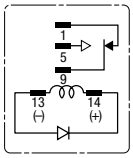
Contacts can be operated by pressing the check button.

With Indicator (-L type)

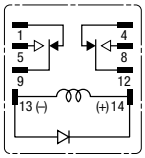
	SPDT	3PDT	4PDT		DPDT	
Below 100V AC/DC				Below 24V AC/DC		When the relay is energized, the indicator goes on. • Relay coils less than 100V DC do not contain a protection diode (except DPDT). • Relay coils below 100V use LED indicator, coils above 100V use neon lamp indicator. • LED color of DPDT model is green
100V AC/DC and over				24V AC/DC and over		

With Diode (-D type)

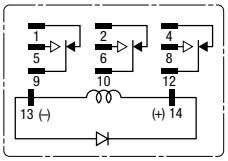
SPDT



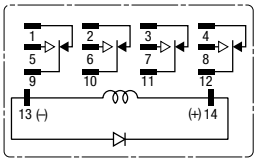
DPDT



3PDT



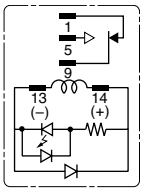
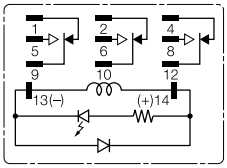
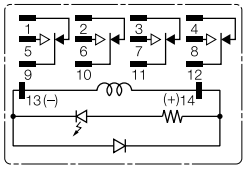
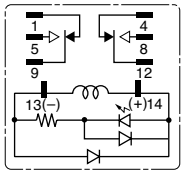
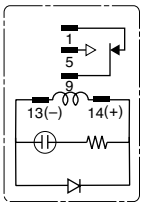
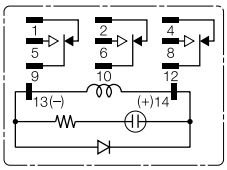
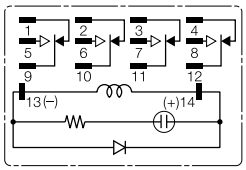
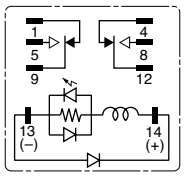
4PDT



Contains a diode to absorb the back emf generated when the coil is de-energized. The release time is slightly longer. Available for DC coil only.

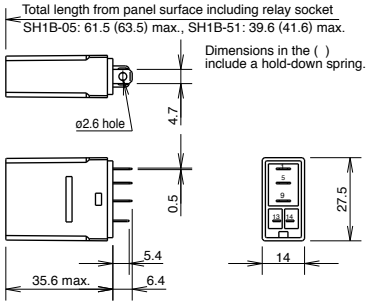
- Diode Characteristics
  Reverse withstand voltage: 1,000V
  Forward current: 1A

With Indicator LED & Diode (-LD type)

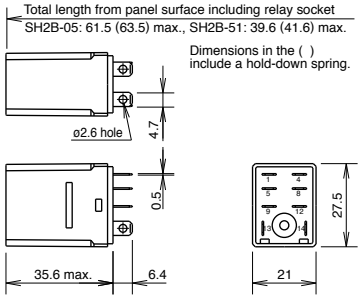
	SPDT	3PDT	4PDT		DPDT	
Below 100V DC				Below 24V AC/ DC		Contains an LED indicator and a surge absorber, and has the same height as the basic type. LED color of DPDT model is green.
100V DC and over				24V AC/ DC and over		

Dimensions (mm)

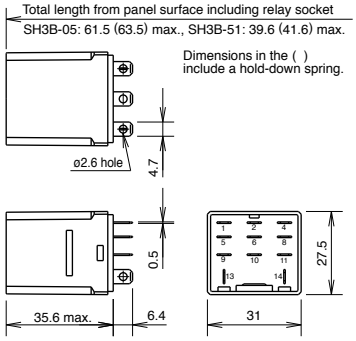
RH1B-U/RH1B-UL/RH1B-UD/RH1B-ULD



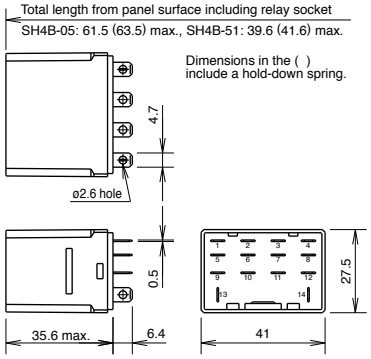
RH2B-U/RH2B-UL/RH2B-UD/RH2B-ULD



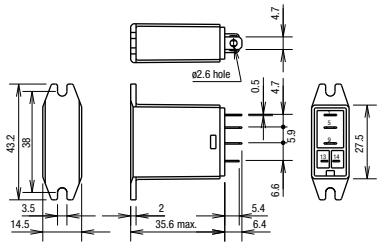
RH3B-U/RH3B-UL/RH3B-UD/RH3B-ULD



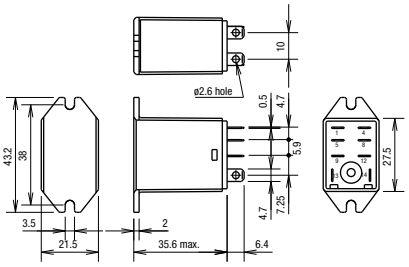
RH4B-U/RH4B-UL/RH4B-UD/RH4B-ULD



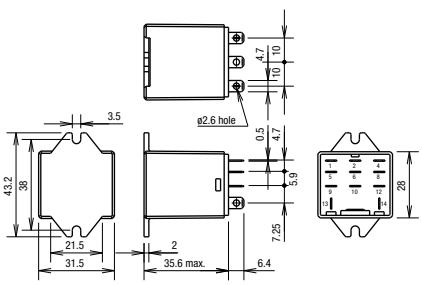
RH1B-UT



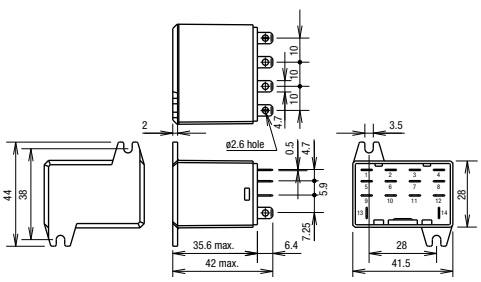
RH2B-UT



RH3B-UT

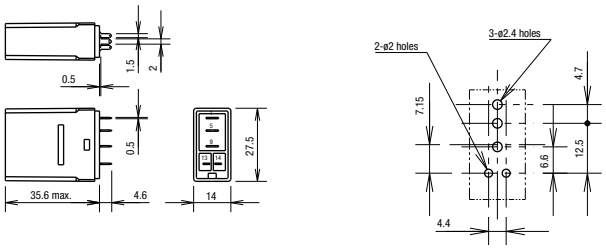


RH4B-UT

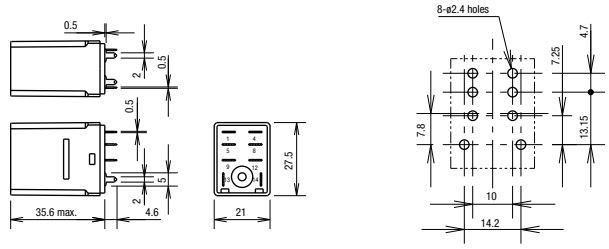


Dimensions con't (mm)

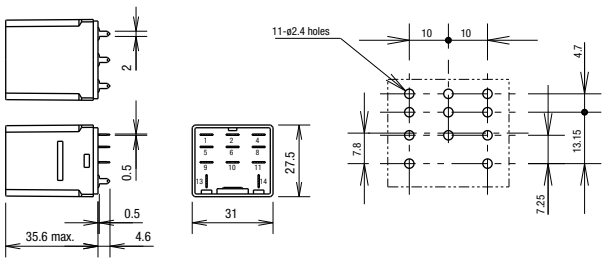
RH1V2-U/RH1V2-UD



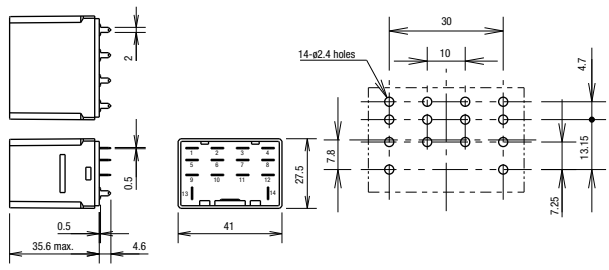
RH2V2-U/RH2V2-UL/RH2V2-UD



RH3V2-U/RH3V2-UL/RH3V2-D

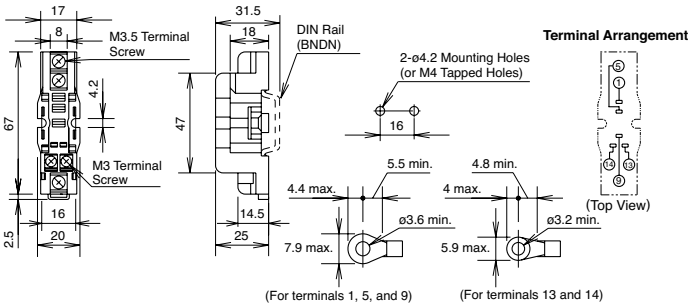


RH4V2-U/RH4V2-UL/RH4V2-UD

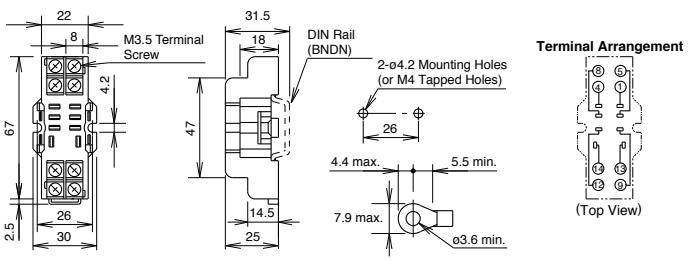


Standard DIN Rail Mount Sockets

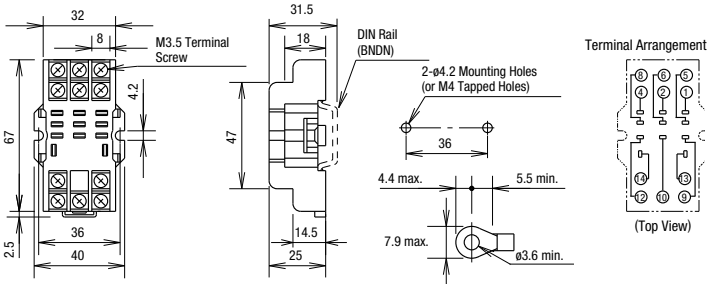
SH1B-05



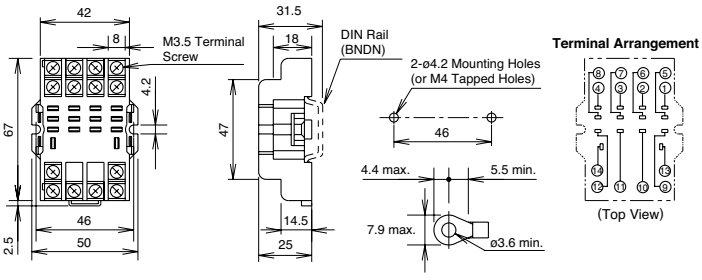
SH2B-05



SH3B-05



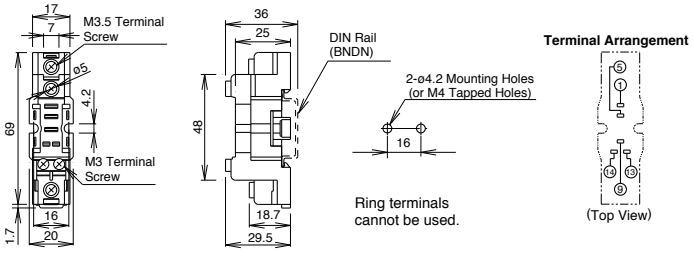
SH4B-05



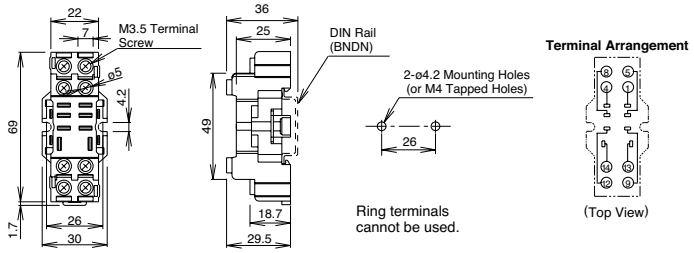
Dimensions con't (mm)

Finger-safe DIN Rail Mount Sockets

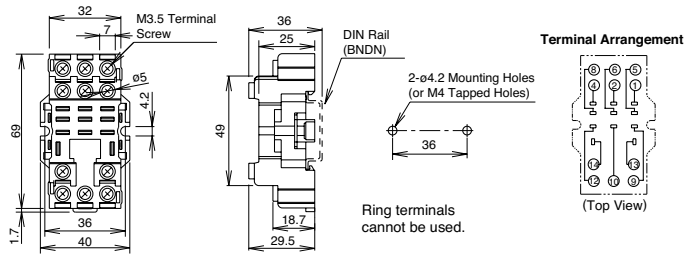
SH1B-05C



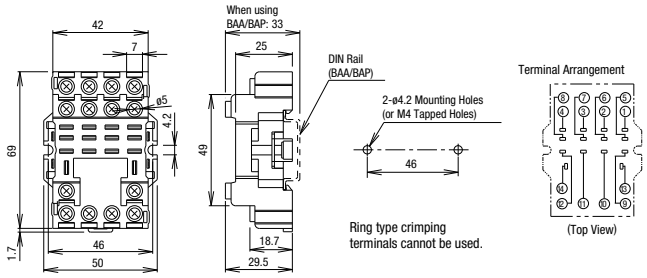
SH2B-05C



SH3B-05C

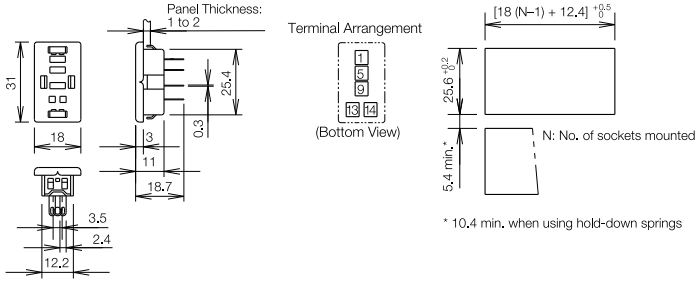


SH4B-05C



Through Panel Mount Socket

SH1B-51



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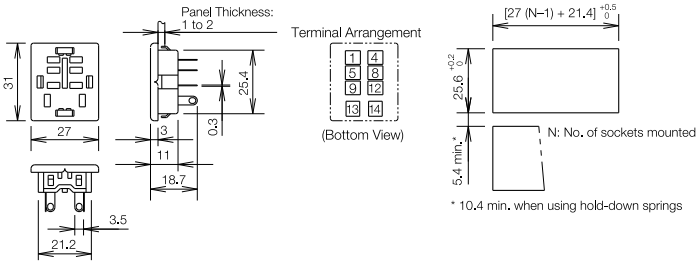
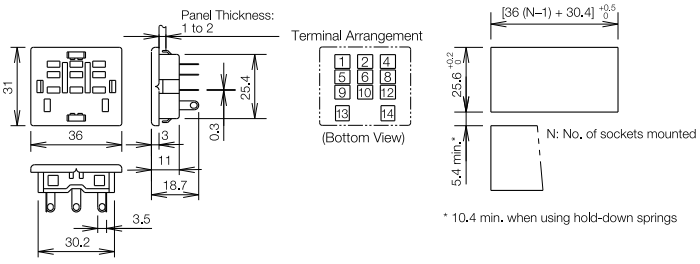


SH3B-51



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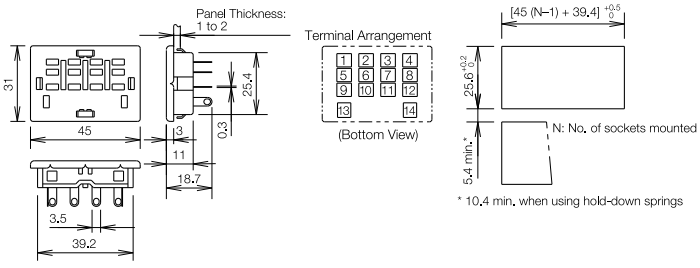
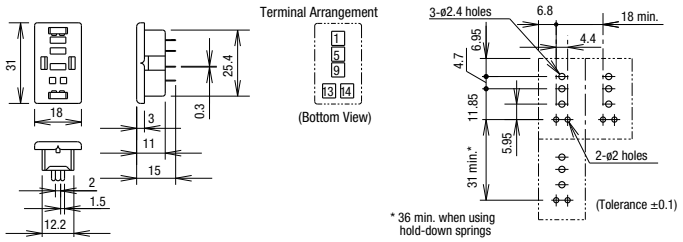


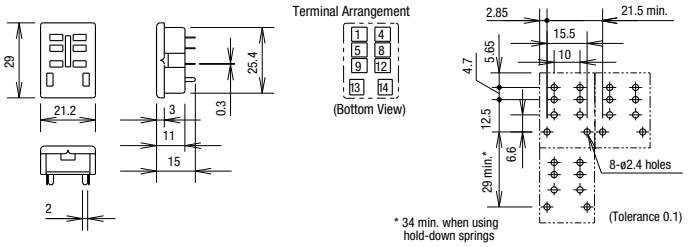
Dimensions con't (mm)

PCB Mount Sockets

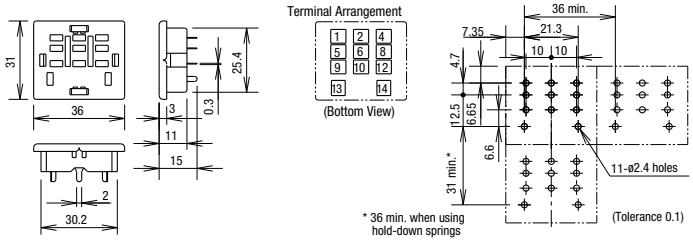
SH1B-62



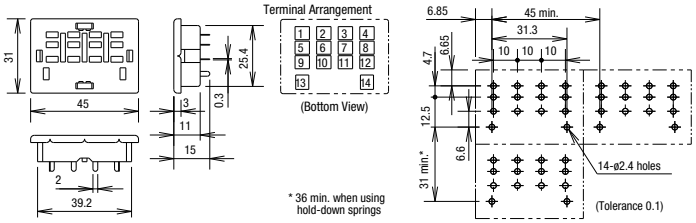
SH2B-62



SH3B-62



SH4B-62

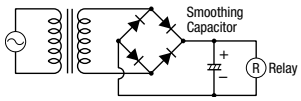


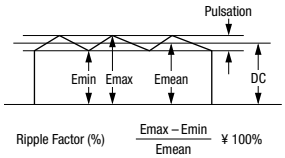
Operating Instructions

Driving Circuit for Relays

1. To ensure correct relay operation, apply rated voltage to the relay coil.

2. Input voltage for the DC coil:
   A complete DC voltage is best for the coil power to make sure of stable relay operation. When using a power supply containing a ripple voltage, suppress the ripple factor within 5%. When power is supplied through a rectification circuit, the relay operating characteristics, such as pickup voltage and dropout voltage, depend on the ripple factor. Connect a smoothing capacitor for better operating characteristics as shown below.



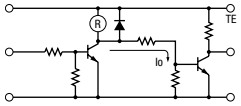


$$\text{Ripple Factor (\%)} = \frac{\text{Emax} - \text{Emin}}{\text{Emean}} \times 100\%$$

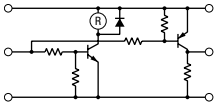
Emax = Maximum of pulsating current
Emin = Minimum of pulsating current
Emean = DC mean value

3. Leakage current while relay is off:
   When driving an element at the same time as the relay operation, special consideration is needed for the circuit design. As shown in the incorrect circuit below, leakage current (Io) flows through the relay coil while the relay is off. Leakage current causes coil release failure or adversely affects the vibration resistance and shock resistance. Design a circuit as shown in the correct example.

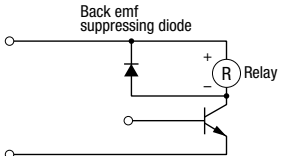
Incorrect



Correct



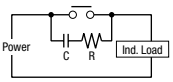
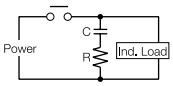
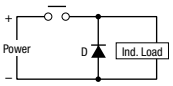
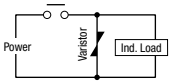
4. Surge suppression for transistor driving circuits:
   When the relay coil is turned off, a high-voltage pulse is generated, causing a transistor to deteriorate and sometimes to break. Be sure to connect a diode to suppress the back electromotive force. Then, the coil release time becomes slightly longer. To shorten the coil release time, connect a Zener diode between the collector and emitter of the transistor. Select a Zener diode with a Zener voltage slightly higher than the power voltage.



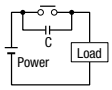
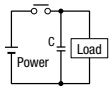
Protection for Relay Contacts

1. The contact ratings show maximum values. Make sure that these values are not exceeded. When an inrush current flows through the load, the contact may become welded. If this is the case, connect a contact protection circuit, such as a current limiting resistor.

2. Contact protection circuit:
   When switching an inductive load, arcing causes carbides to form on the contacts, resulting in increased contact resistance. In consideration of contact reliability, contact life, and noise suppression, use of a surge absorbing circuit is recommended. Note that the release time of the load becomes slightly longer. Check the operation using the actual load. Incorrect use of a contact protection circuit will adversely affect switching characteristics. Four typical examples of contact protection circuits are shown in the following table:

RC		This protection circuit can be used when the load impedance is smaller than the RC impedance in an AC load power circuit. • R: Resistor of approximately the same resistance value as the load • C:0.1 to 1 µF
		This protection circuit can be used for both AC and DC load power circuits. R: Resistor of approximately the same resistance value as the load C: 0.1 to 1 µF
Diode		This protection circuit can be used for DC load power circuits. Use a diode with the following ratings. Reverse withstand voltage: Power voltage of the load circuit x 10 Forward current: More than the load current
Varistor		This protection circuit can be used for both AC and DC load power circuits. For a best result, when using a power voltage of 24 to 48V AC/DC, connect a varistor across the load. When using a power voltage of 100 to 240V AC/DC, connect a varistor across the contacts.

3. Do not use a contact protection circuit as shown below:

	This protection circuit is very effective in arc suppression when opening the contacts. But, the capacitor is charged while the contacts are opened. When the contacts are closed, the capacitor is discharged through the contacts, increasing the possibility of contact welding.
	This protection circuit is very effective in arc suppression when opening the contacts. But, when the contacts are closed, a current flows to charge the capacitor, causing contact welding.

Generally, switching a DC inductive load is more difficult than switching a DC resistive load. Using an appropriate arc suppressor, however, will improve the switching characteristics of a DC inductive load.

Soldering

1. When soldering the relay terminals, use a soldering iron of 30 to 60W, and quickly complete soldering (within approximately 3 seconds).

2. Use a non-corrosive rosin flux.

Operating Instructions con't

Other Precautions

1. General notice:
   To maintain the initial characteristics, do not drop or shock the relay.

   The relay cover cannot be removed from the base during normal operation. To maintain the initial characteristics, do not remove the relay cover.

   Use the relay in environments free from condensation, dust, sulfur dioxide (SO_2), and hydrogen sulfide (H_2S).

   Make sure that the coil voltage does not exceed applicable coil voltage range.

2. UL and CSA ratings may differ from product rated values determined by IDEC.

3. Do not use relays in the vicinity of strong magnetic field, as this may affect relay operation.

Safety Precautions

- Turn off the power to the relay before starting installation, removal, wiring, maintenance, and inspection of the relays. Failure to turn power off may cause electrical shock or fire hazard.
- Observe specifications and rated values, otherwise electrical shock or fire hazard may be caused.
- Use wires of the proper size to meet voltage and current requirements. Tighten the terminal screws on the relay socket to the proper tightening torque.
- Surge absorbing elements on AC relays with RC or DC relays with diode are provided to absorb the back electromotive force generated by the coil. When the relay is subject to an excessive external surge voltage, the surge absorbing element may be damaged. Add another surge absorbing provision to the relay to prevent damage.

Precautions for the RU Relays

- Before operating the latching lever of the RU relay, turn off the power to the RU relay. After checking the circuit, return the latching lever to the original position.
- Do not use the latching lever as a switch. The durability of the latching lever is a minimum of 100 operations.
- When using DC loads on 4PDT relays, apply a positive voltage to terminals of neighboring poles and a negative voltage to the other terminals of neighboring poles to prevent the possibility of short circuits.
- DC relays with a diode have a polarity in the coil terminals. Apply the DC voltage to the correct terminals.

Section III – AIR COMPRESSOR

1. Jefferson, GA - Spec.
2. Recommended Equipment Layout
3. UP6 Series Brochure
4. UP6-15c-125 Engineering Data
5. UP6-15c-125 GA Drawing
6. UP6-15c-125 Electrical Drawing
7. UP6-15c-125 - P&ID
8. UP6-15c-125 - Detailed Description
9. Modular Desiccant Dryer Brochure
10. DA100IM Engineering Data
11. DA100IM GA Drawing
12. DA100IM Electrical Drawing
13. DA100IM P&ID
14. DA100IM Detail Description
15. Filter Brochure
16. Filter GA Drawing

17.FA110IH Performance Description

18.FA110IG Performance Description

19. FA110IH Material of Construction

20. FA110IG Material of Construction

21. FA110IH Detailed Description

22. FA110IG Detailed Description

PROJECT NAME:

Jefferson, GA

PROJECT NUMBER:

PARKSON PACKAGE:

CW-15-RD-SL-VALUE
Value Package

COMPRESSOR PROVIDER:

ARLE COMPRESSORS OF FLORIDA

Ingersoll Rand
Inspiring Progress™

Submittal Table of Contents

Submittal Table of Contents

PACKAGE CW-15-RD – Shipped Loose – VALUE PACKAGE

The Parkson Compressor System is a complete compressed air system shipped loose for contractor mounting, piping, and wiring. The system is comprised two (2) rotary screw air compressors each mounted on a 120 gallon tank. Each Rotary Compressor will have 460/3/60 Voltage. The system will have one free standing desiccant air dryer with pre & after filtration. NOTE: All Equipment will come shipped loose to be installed by other.

PACKAGE OPERATION

The compressor system shall support the air requirements of the sand filter, one compressor shall maintain 100% of the air required with the other compressor in standby mode. The compressor system has no capability for alternation between the primary and standby compressor. It is recommended to configure the pressure bands between the compressors such that the standby compressor will turn on if the minimum pressure is reached in the event of a failure or a large air demand.

COMPRESSOR (S)

PACKAGE PRE-FILTER:

The cooling and intake airflow is pre-filtered through an easy to service electrostatic filter panel, which protects the dryer and main cooler matrix from heavy dirt ingress thus reducing maintenance requirements.

INLET AIR FILTER:

Inlet air filtration is accomplished by a large 99.9% efficient at 3 micron and above, dry type air cleaner.

AIREND:

Since the airend is the fundamental component in a rotary screw compressor package, reliability, performance and efficiency are determined by selection of the most effective design, maintenance of close manufacturing tolerances, and precise assembly of the airend itself. All UP Series units, apply proven airends achieving high levels of efficiency and durability.

A high efficiency asymmetrical profile is developed through a unique two-step machining process. The first stage develops the basic wrap angle profile and is a rough-cut. The final stage is a finish grinding process, which ensures a hard, true rotor surface. The rotor shafts are precision ground to tolerances within 12 microns (0.0005 of an inch). The rotor housings are made of high quality, close grain cast Iron.

Bearing configuration used on all Small UP Series models is the tapered rollers thrust bearing and parallel roller journal bearing. These roller bearings are able to handle all loads,

radial, thrust or a combination of both. With this bearing configuration, the discharge end of the male and female rotors are each equipped with a pair of tapered roller bearings offset at opposing axis for maximum positional stability and absorption of thrust and radial loads. The thrust bearing housing is made of a close grain cast iron.

Cylindrical roller bearings are used to carry the radial loads on the inlet end of the rotors. All bearings, whether thrust or radial, are premium specification, which provide truer, harder running surfaces for both inner and outer bearing races.
A double shaft seal is fitted on the main input shaft.

Coolant dams are machined at the bearing locations. This provides an area for coolant to accumulate when the compressor is shut off. Upon start-up the bearings, which are resting in coolant retained by the coolant dam is immediately lubricated, thereby assuring long life.

COOLANT RESERVOIR:

A pre-separator is fully integrated with the airend forming a single module. The highly efficient separation system, combined with suitably sized sump volumes, provides for normal coolant top-up intervals of 500 hours. A pressure relief valve mounted on the housing protects the package. The coolant filler, is designed to prevent overfill the compressor, and a visual coolant level indicator is located on the side of the module. A drain point is provided at the bottom of the sump.

MAIN DRIVE MOTOR:

The main drive motor is matched to the requirements of the torque and the load of the compressor and to specific design criteria that enable the motor to develop peak efficiency and power factor at full load. Double shaft construction with the cooling blower mounted on main shaft provides assured cooling.

MOTOR FRAME:

Standard NEMA frame, 2 pole, E-pact efficiency rated Open Drip Proof (ODP) three phase motors are used. Speed, torque and operating characteristics have been designed to match the load of the compressor.

MOTOR INSULATION:

The selected motor has a minimum of class F insulation as standard, and is specified to operate in ambient conditions up to 104 ºF (40 ºC). In addition the motor is specified to operate at maximum load with a temperature rise some 27 ºF (15 ºC) below that permitted by the design code. This conservatism is frequently referred to as “Class F with class B temperature rise”

BELT DRIVE ASSEMBLY:

The power transmission from the drive motor to the airend male rotor is by long life non-stretching poly-vee belt with easy to adjust belt tension control and simple access for maintenance. This assures performance integrity and belt life. The complete drive system is contained within a protective guarding.

LUBRICATION SYSTEM:

Elements of the lubrication system include;

- **Coolant Filtration -** The full capacity coolant filter is a 5 micron replaceable element. The system contains an internal pressure relief that bypasses at 2.5 bar (36 psi) in the event that the change warning is not acknowledged.
- **Coolant/Lubricant Temperature Control -** A thermostatic control valve is mounted downstream of the oil cooler. The temperature sensitive element controls the flow of coolant through the oil cooler. This provides the proper injection temperature and assures fast warm-up.
- **Coolant Injection -** The coolant is injected through a single large port on the female rotor inlet side. This ensures the best possible pre-sealing of the rotor, plus an optimum mix of coolant with inlet air. Coolant flow is maintained by the differential pressure between the separator tank and the airend inlet.

COOLANT/AIR SEPARATION:

After compression and discharge from the airend, the air is heavily laden with coolant. A separator is used to remove the fluid from the air stream and does so with a three stage separation system. In the first stage, air and coolant mixture from the airend discharge directly enters the separator tank through a nozzle, which directs the mixture flow within the volume. This action forces heavier coolant particles to the periphery of the tank. These particles combine with the main liquid body in the sump. The airflow then passes through the cartridge coalescing element, which combines the second and third stage of separation. The separator cartridge is two-stage with reinforced construction. Coolant, which has collected at bottom of the cartridge is drawn back to the airend inlet through a scavenge system.

The compressed air then passes to the air-cooled aftercooler where coolant vapor carryover will be further removed as it is condensed and drained together with water condensate. The carryover after the aftercooler is less than 5PPM (5 mg/m3.)

Due to the conservative sizing of the air passages and the separator cartridge, there is a minimal pressure drop. This reduces to a minimum, power required to move the air through the compressor system.

A combined minimum pressure /check valve regulates the air discharge from the separator. This ensures that when the unit is unloaded, sufficient pressure is maintained in the tank to propel the coolant through the system. Compressors are supplied with an inclusive factory fill of Premium Compressor Coolant that provides extended operating life.

COOLERS:

Compressors come with integrally mounted air-cooled combination heat exchanger that cools both the coolant and compressed air and is of tube and fin design. Constructed from aluminum, it is designed to operate in ambient temperatures from 35°F (2 ºC) up to 104°F (40 ºC) The after cooler cools the compressed air to 18°F (10 ºC) above ambient air temperature at 104°F (40 ºC) and 60% RH. Centrifugal cooling fan is mounted in an internal segregated cooling compartment. Cooling air is forced across the cooler with even velocity over the full surface area of the cooler matrix.

PIPING:

The compressor utilizes flexible SAE hoses with JIC fittings, rigid steel piping, Bundy weld tubing, flexible connectors and nylon tubing as appropriate to provide vibration free operation. SAE "O" Ring fittings are applied on all lubricant connections. Each compressor system, after manufacturing and assembly, will be 100%inspected and tested to provide a piping system with minimum potential for leaks, which is easy for maintenance.

CONTROL PANEL:

Compressors includes a standard control module, which provides starting, stopping, capacity and pressure control, together with operating and safety control for the package.

STARTER (Fixed Speed):

The compressor has an integrally mounted, starter enclosure with full voltage starter. Motor overload protection is designed and sized to match the specific characteristics of the motor.

COOLANT:

Compressors are supplied with a factory fill of Premium Compressor Coolant.

DESICCANT DRYER

General Description

The Ingersoll Rand Modular dryer is a heatless modular dryer comprising of an extruded aluminum column filled with desiccant material which is assembled together using a bottom inlet and top outlet manifold which allows the design to meet varying capacity requirements.

One chamber is in operation (drying) while the opposite chamber is regenerating using the pressure swing adsorption (PSA) method.

A small volume of the dried compressed air is used to regenerate the saturated desiccant bed by expanding dried air from line pressure to atmospheric pressure, removing the water adsorbed by the desiccant material, and therefore, regenerating the dryer.

The desiccant chambers are repeatedly regenerated and brought on-line using a solid state timer.

The Ingersoll Rand Modular dryer is a heatless modular dryer comprising of two extruded aluminum columns filled with desiccant material which are assembled together using a bottom inlet and top outlet manifold which allows the design to meet varying capacity requirements.

One column is in operation (drying) while the opposite column is regenerating using the pressure swing adsorption (PSA) method.

A small volume of the dried compressed air is used to regenerate the saturated desiccant bed by expanding dried air from line pressure to atmospheric pressure, removing the water adsorbed by the desiccant material, and therefore, regenerating the dryer. The desiccant columns are repeatedly regenerated and brought on-line using a PLC controlled sequence.

Operating Limitations
The Ingersoll Rand Modular desiccant delivers 32 scfm. Maximum operating pressure is 200 psig. Maximum inlet temperature for all models is 122°F (50°C). Designed to perform in conformance with ISO 8573 standards.

General Purpose
The Ingersoll Rand Modular desiccant dryer is designed to remove water vapor from compressed air for critical applications. This dryer is designed for indoor use with ambient temperatures above 35°F (1.5°C).

Adsorption System
Dryer uses an activated alumina for adsorbing the moisture from the compressed air.

Switching Valves
For continuous operation the compressed air stream is automatically cycled between two desiccant columns, one adsorbing while the other is being regenerated. On all models this cycling is done by the use of solenoid valves.

Desiccant Towers
The heart of all adsorption dryers is the desiccant column. For continuous operation two columns are situated in parallel utilizing a common aluminum manifold. All models use this high tensile extruded aluminum column design.

Control and Instrumentation
The continuous switching between the desiccant columns is controlled by a PLC sequence. Pressure gauges are provided for both towers.

Enclosure
The PLC is contained inside a flame retardant ABS enclosure housing.

Filters
A high efficiency coalescing pre-filter and general purpose post-filter are supplied shipped loose with fitting to be installed by other.

The coalescing type pre-filter shall remove particles down to 0.01 micron, and coalescing liquids and aerosols down to (0.01 mg/m3) 0.01 ppm (Air Quality to ISO 8573.1 Class 2 Dirt, 2 Oil). This filter is followed by a particulate type after-filter, which removes particles down to 1 micron (Air Quality to ISO8573.1 Class 3 Dirt).

Fundamentals of Air Drying

How Water gets into the Air System

Water vapor becomes a major constituent in compressed air systems as it is distributed with the compressed air. Additional cooling of the compressed air as it is distributed in the plant air piping will condense the water vapor. This condensed water will corrode system components resulting in increased maintenance costs and reduced system efficiency. The Ingersoll Modular air dryer will adsorb the water of the air system before problems develop. All atmospheric air contains a certain quantity of water vapor, which is mixed with other gases eg nitrogen, oxygen, carbon monoxide. This water vapor is drawn into the compressor with the incoming air during the compression cycle. Compressed air, at normal ambient temperatures, cannot hold as much water vapor as air at atmospheric pressure, however, the heat generated during the compression cycle increases its ability to hold water vapor. When the compressed air is cooled between the compressor and the point of use, this water vapor will condense out in the system piping, air receiver, tools etc. The quantity of water vapor condensed will be that amount which is in excess of the saturated temperature of the compressed air.

Aftercooling

Almost every air system uses an after cooler (air cooled or water cooled) to cool compressed air as it exits the air compressor. The air exiting the compressor is typically at 95°C (204°F) to 180°C (365°F), depending on the type of compressor. The after cooler will cool the air to approximately 9°C (15°F) above the cooling medium, depending on the temperature of cooling water or cooling air. In almost all cases, the air exiting the after cooler is saturated, meaning it cannot hold any additional water vapor at its present temperature and pressure. Any decrease in compressed air temperature will result in water vapor condensing into the air system.

Dryer Operation

Compressed Air Flow

100% saturated compressed air enters the dryer via the inlet valve and is directed up through the drying column/s depending on where the PLC sequence step is, this will be either the left column/s or right column/s).

During its flow, water vapor is adsorbed from the air. The adsorption is based on the affinity of the desiccant material towards the water vapor in the air. One of the exhaust solenoid valves will be open and the other closed (again depending on the cycle position). This normally will be open for 4 minutes and 10 seconds and then closed for the same amount of time (continuous operation). This continuous cycling is controlled by a PLC.

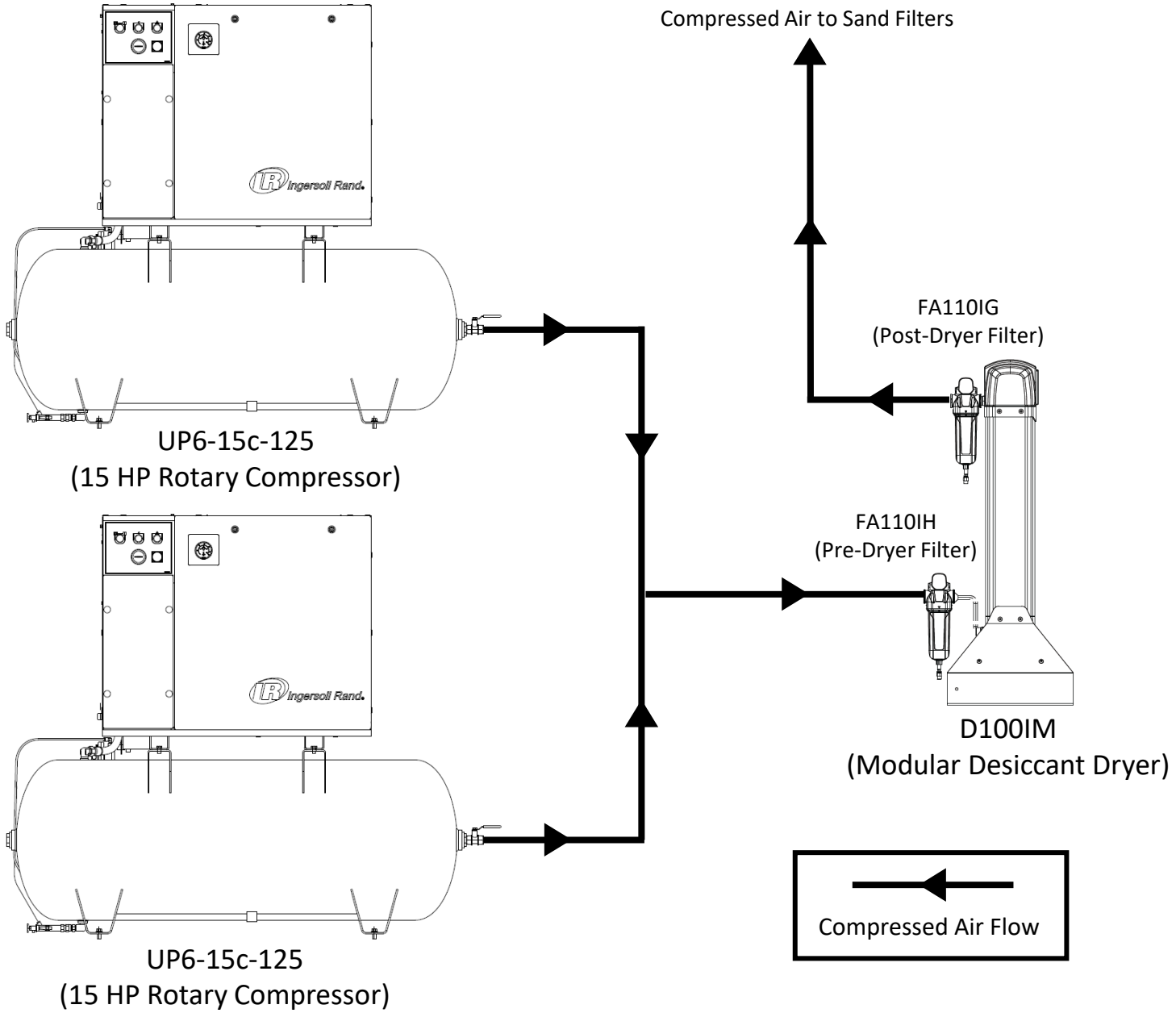
Regeneration Air Flow
Simultaneously to drying the compressed air in the other column/s, a limited amount of dried air is passed from the dryer outlet and expanded to atmospheric pressure through purge orifice housed within the upper valve block This regeneration air flows downwards through the saturated desiccant of the other column/s. The expanded dry air flows down through the column/s and regenerates the desiccant. The expanded regeneration air containing the adsorbed moisture is discharged through the exhaust solenoid valve and muffler.

After 4 minutes, 10 seconds, the exhaust solenoid valve closes, the regenerated column/s is/are re-pressurized through the purge air orifice. The pressure in the saturated column/s is vented and the columns switched. The fully regenerated column/s will now dry the saturated compressed air while the other column/s is/are being regenerate.

Air Compressor	
Model	(2) UP6-15c-125
Capacity	52.0 CFM (each)
HP	15 HP (each)
Rated Pressure	125 PSIG
Main Motor Voltage	460/3/60
Main Motor FLA Draw	18.7 (each)
Main Motor RPM	3530
BTU Discharge	42,000 Btu/hr (each)
Noise Level	69 dBA

Desiccant Air Dryer (s)	
Dryer Amp Draw	.5
Model Number	DA100IM
Voltage	115/1/60
Package Discharge Conn	1.00” NPT
Capacity	59.0 CFM
Max Pressure	200 PSIG

RECOMMENDED EQUIPMENT LAYOUT



Rotary Air Compressor

Model: UP6-15c-125

Qty: 2

Ingersoll Rand
Inspiring Progress™

Ingersoll Rand

Fixed Speed Rotary Screw Compressors

UP6 Series 4-11 kW (5-15 hp)

More Than 145 Years of Compressed Air Innovation

Ingersoll Rand introduced its first air compressor in 1872. Over the next 145 years, we have continued to develop rugged, reliable, industry-leading rotary screw compressor technologies. No matter what the application, Ingersoll Rand rotary screw technology provides clean, dry air in all operating conditions to meet your specific performance needs, reduce costly downtime and maximize your productivity.

UP6 Series 4-11 kW (5-15 hp)

Offering an exceptional value without sacrificing the reliability you've come to expect from Ingersoll Rand, the UP6 Series of oil-flooded rotary screw compressors provides a complete air solution in an easy to use, easy to access compact package, delivering efficient performance.

Reliability

- Fewer connections and smart integration eliminate leaks and pressure drops, ensuring maximum reliability
- Closely maintained discharge pressure avoids excessive pressure bands and increases downstream tool and equipment life
- Premium Poly-V belt drive system minimizes belt stretching and increases air output

Productivity

- Whisper-quiet operation as low as 65 dbA allows for installation closer to point of use, reducing costs and ensuring better, safer work environment
- Advanced, high-efficiency combination cooler with roof mount package exhaust enables easy ducting
- Small footprint frees up valuable floor space and reduces installation costs

Ease of Use

- Simple diagnostics with visual indication of operating status, hours and fault warnings for ease-of-operation and reduced downtime
- Auto start/stop operation ensures maximum flexibility
- Spacious design maximizes serviceability

Exceptional Value. Proven Design.

High-Efficiency Integrated Compression Module

The UP6 airend, interconnecting piping and separation system have all been integrated into one simple design to provide maximum efficiency and serviceability in a compact footprint.

1 Total Air System Cabinet

The TAS integrated dryer option provides clean, dry air in a single package, minimizing installation costs

2 Easy to Use Controls

Visual indicators and auto start/stop operation give you maximum flexibility

3 Simple Serviceability

All consumables have been conveniently positioned to facilitate serviceability

4 Compact Design

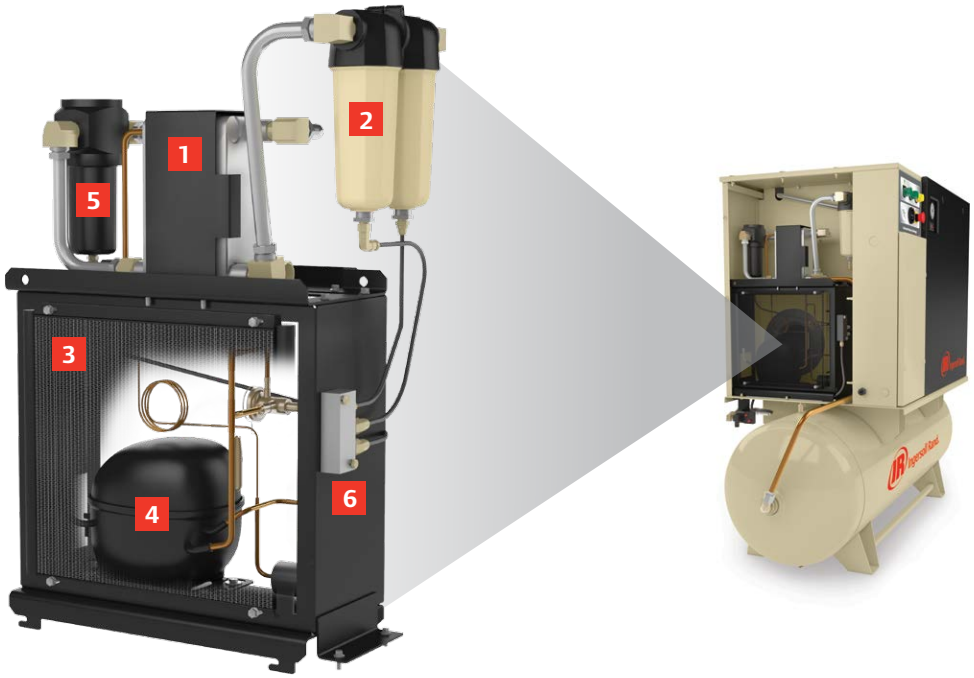
Small footprint frees up valuable floor space and reduces installation costs

5 Advanced Cooling

Efficient aftercooler with top package exhaust simplifies ducting

Convenient Choices for a Complete Air Solution

To provide the most comprehensive air solution, Ingersoll Rand UP6 Series 5-15 hp compressors are available with a Total Air System (TAS) option. These complete cooler and dryer systems come with moisture separators, drain ports and filters. No matter the capacity, Ingersoll Rand provides the complete answer in a compact solution that fits your air and workspace requirements.



1. 3-in-1 heat exchanger
2. High-capacity, general purpose filter or filters
3. Condenser
4. Reliable refrigerant compressor
5. Moisture separator
6. Electronic drain valve (EDV)

Energy-Saving Refrigerated Air Dryer

- Particulate removal to 0.1 micron
- High-efficiency, direct expansion refrigerated dryer operates continuously, ensuring constant dew point
- Removes moisture from compressed air, eliminating internal pipe rusting, the main cause of premature tool and seal wear

Smart Integration Benefits

- Dry air receiver mounted as a compact package lowers the cost of installation (optional floor mount also available)
- Easy access to all compressor and air treatment components promotes serviceability
- Simplified piping eliminates potential leaks
- Single-point condensate drain system, instead of separate points, reduces installation cost

Flexible Performance for Any Application

The Ingersoll Rand UP6 Series 5-15 hp compressors provide an excellent value for your compressed air needs. If your application requires more from a compressed air system, look no further than Ingersoll Rand. Our premium R Series adds a high-efficiency, robust motor and more intelligent controls to give you the ultimate in performance.

Features	R4-11i	UP6 5-15c
TEFC Tri-Voltage motor	●	
Intellisys controls	●	
Total Air System (TAS)	O	O
PORO (Power Outage Restart)	O	O
80 gallon or 120 gallon receiver tank	O	O
Ultra FG or Ultra EL coolant	O	
High ambient	O	
Outdoor modification	O	
200 psig	O	

● Standard feature O Optional feature "Blank" Not Available

60 Hz Specifications - Total Air System

Model	hp	Discharge Pressure Compressor Package psig	Capacity* cfm	db(A)†
UP6-5TAS-125	5	119	18.5	65
UP6-5TAS-150	5	145	16	65
UP6-7TAS-125	7.5	119	28	65
UP6-7TAS-150	7.5	145	25	65
UP6-10TAS-125	10	119	38	68
UP6-10TAS-150	10	145	34	68
UP6-15cTAS-125	15	119	55	69
UP6-15cTAS-150	15	145	50	69

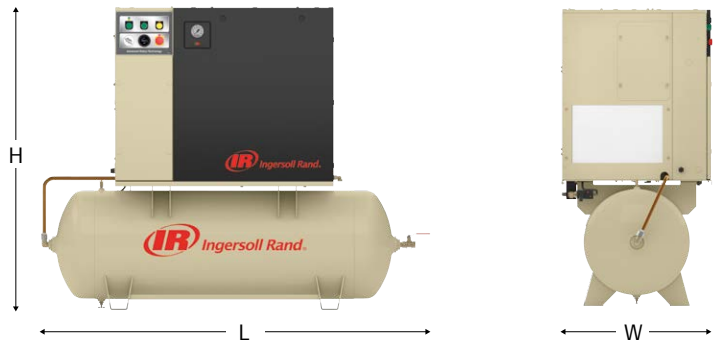
60 Hz Specifications - without Total Air System

Model	hp	Discharge Pressure psig	Capacity* cfm	db(A)†
UP6-5-125	5	125	14.9	65
UP6-5-150	5	150	12.9	65
UP6-7-125	7.5	125	26.3	65
UP6-7-150	7.5	150	23.1	65
UP6-10-125	10	125	36.1	68
UP6-10-150	10	150	32.3	68
UP6-15-125	15	125	52.0	69
UP6-15-150	15	150	47.3	69

Baseplate and Receiver Mounted Units Dimensions and Weight

	Length in	Length mm	Width in	Width mm	Height in	Height mm	Total Air System Weight lb	Total Air System Weight kg	without Total Air System Weight lb	without Total Air System Weight kg
Base Mount	40.9	1,039	28.6	737	36.9	937	725	330	655	298
80 Gallon Receiver Tank	70.2	1,783	29.0	737	56.6	1,438	983	447	908	412
120 Gallon Receiver Tank	74.8	2,000	29.0	737	60.7	1,541	1,021	465	946	430

*Performance in accordance with ISO 1217 1996 annex C †Measured in accordance with CAGI-Pneurop test code PN8NTC2.3



Genuine Ingersoll Rand From Start to Finish

Choose genuine Ingersoll Rand parts and accessories to lower your total cost of ownership. Generic parts suffer from inferior performance that will cost you more in the long run. We design our products with safety in mind, eliminating any unnecessary risk you may be taking by using unknown materials.

1

Fully Synthetic Lubricants

The best way to protect your investment is by using Ingersoll Rand industry-leading, fully synthetic lubricants, which support all types of compressed air systems.

2

Installation Solutions

We offer everything you need to deliver clean, dry air from the compressor to your point of use. Our SimplAir piping line, couplings and receiver tanks give you optimal air flow while minimizing pressure loses over the length of your system.

3

Condensate Management

Ingersoll Rand oil water separators and drain valves help make condensate management easier, more efficient and more environmentally friendly. Premium drain products ensure no loss of valuable compressed air.

4

Line Filters

F-Series filters reduce contamination in your air stream to help protect critical processes and valuable equipment. NL Module coalescing filters provide instrument quality compressed air with a minimal 0.5 psig pressure drop for long-term cost savings.

Your Trusted Partner in Compressed Air

Optimize your total cost of ownership, while maximizing reliability, efficiency and productivity with our full complement of services that span the entire lifecycle of your compressed air system.

PackageCARE™
We Protect You

CARE Maintenance Programs | RELIABILITY FOR LIFE

Compressed air is critical to your operation. A proper maintenance strategy is crucial to avoiding unplanned, unbudgeted downtime and production interruptions. By choosing an Ingersoll Rand CARE maintenance service program — from full risk transfer to routine maintenance or parts coverage — you are investing in your future with a trusted global partner.

Ingersoll Rand

Ingersoll Rand (NYSE:IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a $13 billion global business committed to a world of sustainable progress and enduring results.

Club Car · Ingersoll Rand · THERMO KING · TRANE

IngersollRandProducts.com

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KNOW PRESSURE COMPRESSED AIR CHALLENGE

CAGI Compressed Air & Gas Institute

LLOYD'S REGISTER LRQA ANAB ACCREDITED ISO 9001

ENGINEERING MANUAL

SSR

Small UP SERIES

CCN: 23753676
Rev.: G CN 1272434
Ref.: 9902
Page: 106
Date: 10th Nov 2017
Cancels: 15th June 2017

Point of Manufacture - Campbellsville, USA

60 HERTZ ENGINEERING DATA

Model		UP6-15c-125	UP6-15c-150	UP6-15c-210
GENERAL COMPRESSOR DATA				
Capacity (Ref. Intake Cond.) FAD (1)	m³/min (cfm)	1.47 (52)	1.33 (47.3)	1.01 (35.9)
Maximum Operating Pressure	barg (psig)	8.6 (125)	10.3 (150)	14.5 (210)
Minimum Operating Pressure	barg (psig)	4.5 (65)	4.5 (65)	4.5 (65)
Maximum Operating Temperature	ºC (ºF)	40 (105)	40 (105)	40 (105)
Minimum Operating Temperature	ºC (ºF)	2 (36)	2 (36)	2 (36)
SOUND LEVEL (2)				
Base mounted Enclosed	dB(A)	69	69	69
COOLING DATA				
Air-cooled (Ambient Temperature 40°C/104°F)				
Coolant Discharge temperature	°C(°F)	100 (212)	99 (210)	98 (208)
A/E Injection Temperature	°C(°F)	82 (180)	81 (178)	80 (176)
(3) Aftercooler - Inlet	°C(°F)	90 (194)	89 (192)	89 (192)
Aftercooler - Outlet	°C(°F)	51 (124)	51 (124)	51 (124)
Heat Removal Oil Cooler	kW (1000 Btu/hr)	10.3 (35.1)	10.3 (35.1)	10.3 (35.1)
Heat Removal Oil and Aftercooler	kW (1000 Btu/hr)	12.3 (42.0)	12.3 (42.0)	12.3 (42.0)
Coolant Flow	lpm (UK gpm)	17.0 (3.7)	21.0 (4.6)	32.0 (7.0)
Fan Air Flow	m³/min (cfm)	30.0 (1060)	30.0 (1060)	30.0 (1060)
Cooling Air CTD	ºC (ºF)	40 (72)	40 (72)	40 (72)
Aftercooler CTD (3)	ºC (ºF)	11 (20)	11 (20)	11 (20)
CONSTRUCTION FOUNDATION AND				
PIPING CONNECTIONS				
Air Discharge Base Mount	Inches BSPT (9)	0.75		
Air Discharge from ASME Receiver	Inches NPT	0.75		
Coolant Drain	Drain Plug	9/16"-SAE		
Power Inlet	Inch	1"		
COOLANT LUBRICATION DATA				
Coolant Sump Capacity	litres (US gal)	3 (.8)		
Total coolant fill capacity	litres (US gal)	4.5 (1.2)		
DIMENSIONS		Basemount	80 gal	120 gal
length, width, height	mm	1040/728/936	1783/737/1513	1900/737/1616
	Inches	40.9/28.7/36.9	70.2/29.0/59.6	74.8/29.0/63.7
GA Drawing Numbers		22431811	24470304	22469191
SHIPPING DATA - NET WEIGHTS				
	kg (lb.)	298 (655)	422 (930)	430 (946)

ENGINEERING MANUAL

SSR

Small UP SERIES

Point of Manufacture - Campbellsville, USA

60 HERTZ ENGINEERING DATA

Model		**UP6-15c-125**	**UP6-15c-150**	**UP6-15c-210**		
AIREND DATA						
Rotor Diameter (male)	mm	74.25	74.25	74.25		
Male Rotor Speed	rpm	6250	5700	4675		
Tip Speed	m/sec	24.30	22.16	18.17		
ELECTRICAL DATA - ALL UNITS SSR UP6-15c		**200v**	**230v**	**380v**	**460v**	**575v**
Nominal Power - Driver	HP	15.0	15.0	15.0	15.0	15.0
Maximum Applied Power - Package	HP	16.5	16.5	16.5	16.5	16.5
Drive Motor Protection		ODP	ODP	ODP	ODP	ODP
Nominal Current - Drive Motor (8)	Amps	39.1	34.0	20.6	17.0	13.7
Package Current - maximum pressure	Amps	43.1	37.4	22.8	18.7	15.1
Drive Motor RPM		3530	3530	3530	3530	3530
Drive Motor Frame		215TZ	215TZ	215TZ	215TZ	215TZ
Drive Motor Locked Rotor (5)	Amps	282.0	256.0	148.0	128.0	104.0
Drive Motor Efficiency (8)		90.2	90.2	90.2	90.2	90.2
Drive Motor Power Factor (8)		0.9	0.9	0.9	0.9	0.9
Test Certificate Number (4)		FD-2016-119463	FD-2016-172404	FDC 086601.2017	FD-2016-172404	FD-2016-172436
Electrical Installation						
Recommended wire size (6)	Awg	4	6	8	10	10
Suggested Fuse Rating (7)	Amps	75	65	35	30	25

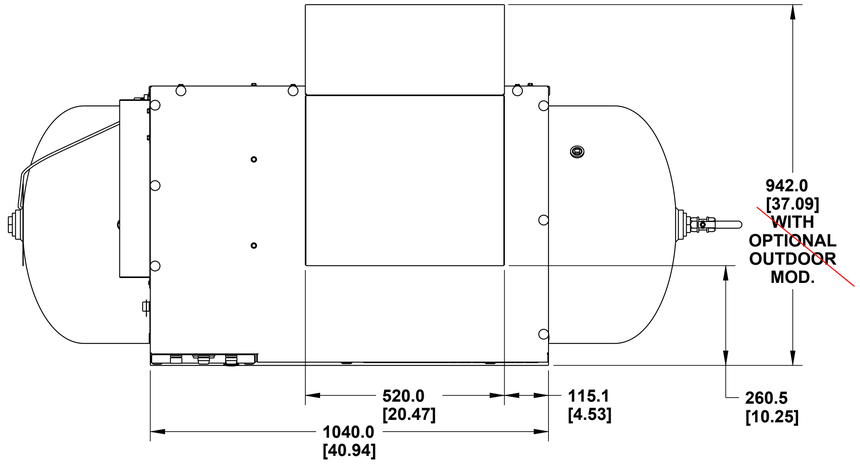
Notes :

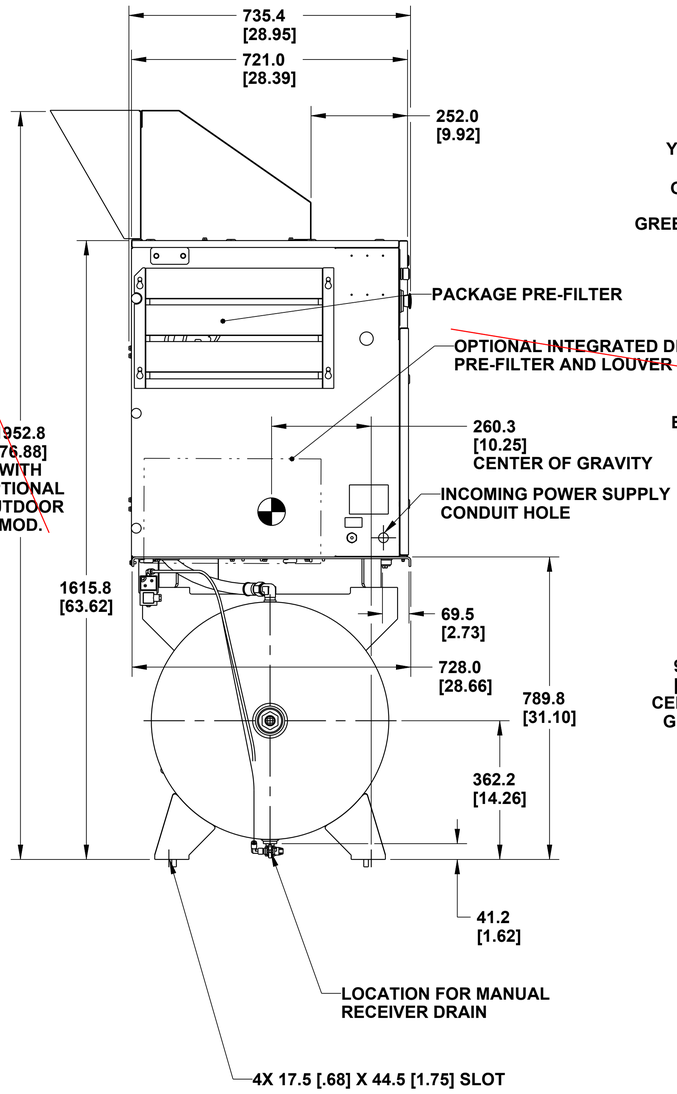
(1) FAD (Free Air Delivery) is full package performance including all losses. Tested in accordance with ISO 1217 : 1996 Annex C.
(2) Measured in free field conditions in accordance with PNEUROP/CAGI test codes, with +/- 3 dB(A) tolerance.
(3) 40% Relative Humidity Inlet Air (For alternate conditions refer to SSR toolbox or contact IR)
(4) Motor test certificate
(5) Inrush amps
(6) This is a minimum requirement based on 90°C wire - It may be necessary to use larger cables to comply with local regulations or if the voltage drop exceeds 5% of the nominal voltage.
(7) Recommended Time delay Fuse. Refer to local code for proper fuse sizing
(8) Measured at nominal motor power
(9) Installation kit will provide flexible connection to NPT or BSPT

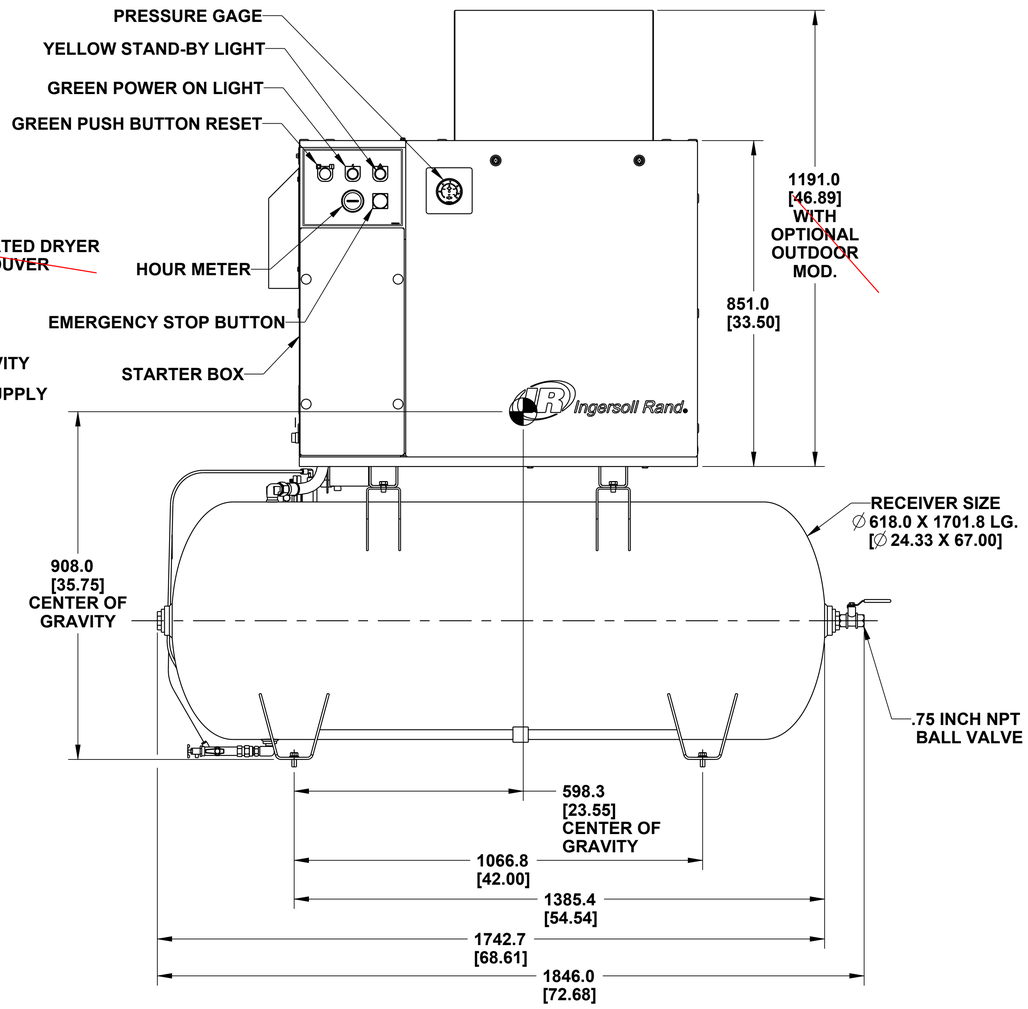
NOTES :

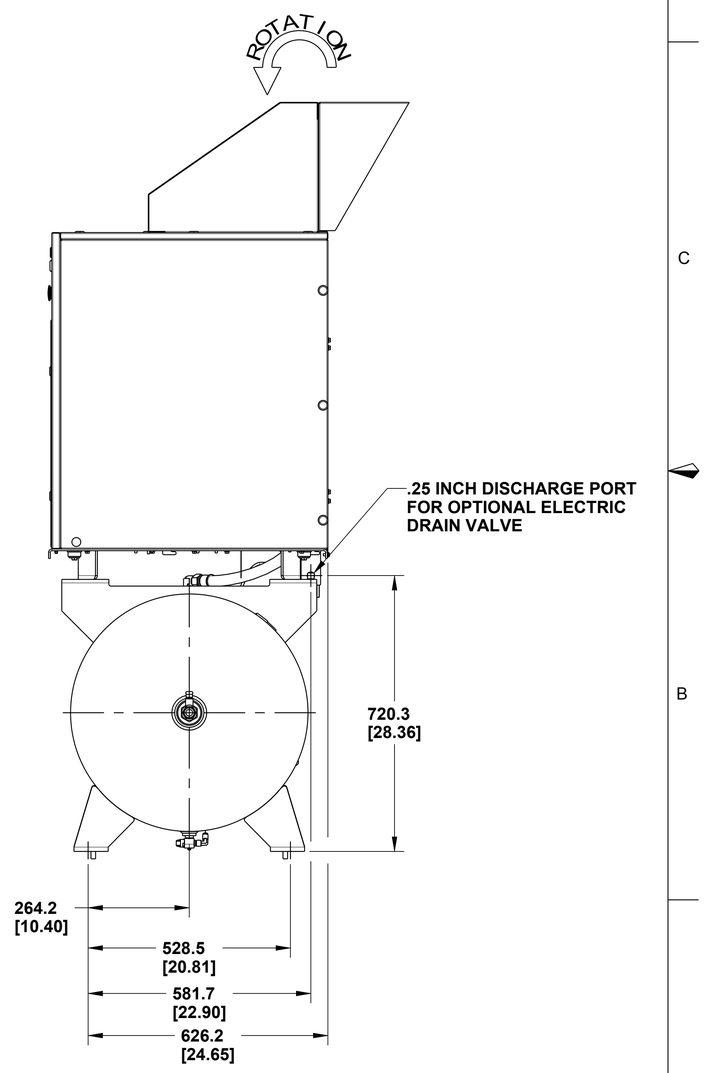
1. FOUNDATION OR FLOOR MUST BE LEVEL AND SUPPORT ALL MOUNTING BOLT LOCATIONS EQUALLY. IF NECESSARY, SHIM OR GROUT THE FOURTH BOLT LOCATION.
2. FOUNDATION BOLTS SHOULD PROJECT THRU NUTS A MINIMUM OF 13mm [.50"] TO ALLOW FOR LEVELING.
3. ALLOW A MINIMUM CLEARANCE OF 1100mm [42"] ON THE FRONT AND 920mm [36"] ON THE TOP, LEFT, RIGHT, AND REAR OF THE PACKAGE FOR PROPER AIR CIRCULATION AND SERVICEABILITY.
4. APPROXIMATE PACKAGE WEIGHT: 430 KG. [946 LBS.].

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
	A	71433	ORIGINAL RELEASE	2004JUN28	VIJAY	B.WISE
	B	73832	ADD THIRD SHEET, UPDATED FORMAT ADD OPTIONAL OUTDOOR MOD. ADD CONTROL AIR CONDENSATE OUTLET ADD REVISION BLOCK	2006NOV30	M.CAIN	C.FRAZIER
1-B5	C	74318	I-R LOGO DECAL 23038474 WAS 22050611	2007FEB17	ISB/NH	K.WHITESELL
1-B7 2-D6 3-D7	D	76570	ADDED INCOMING POWER DIM'S: 70.9 AND 764.8 ADDED AREA AND NOTE: OPTIONAL INTEGRATED DRYER, PRE-FILTHER AND LOUVER UPDATED VIEW TO SHOW OPTIONAL DRYER REMOVED NOTE: .75" NPT 60HZ, .75" BSPT 50HZ	2007OCT22	R.REDMOND W.SORAH	C.FRAZIER
	E	77147	UPDATED VIEWS TO CURRENT CONFIGERATION	2008DEC19	W.SORAH	C.FRAZIER
1-B4 1-B4 1-B5	F	78580	UPDATED VIEWS TO CURRENT CONFIGURATION REMOVED LOGO DECAL 22913032. LOGO DECAL 23038466 WAS 22435713. FORKLIFT DECAL 23548985 WAS 93171262	2010APR09	H.AVINASH	C.FRAZIER
2-C2	G	78494	UPDATED VIEW OF PRESSURE SWITCH	2010JUN04	R. REDMON	C.FRAZIER
	H	-	SEE SHEET 2 FOR DETAILS	-	-	-



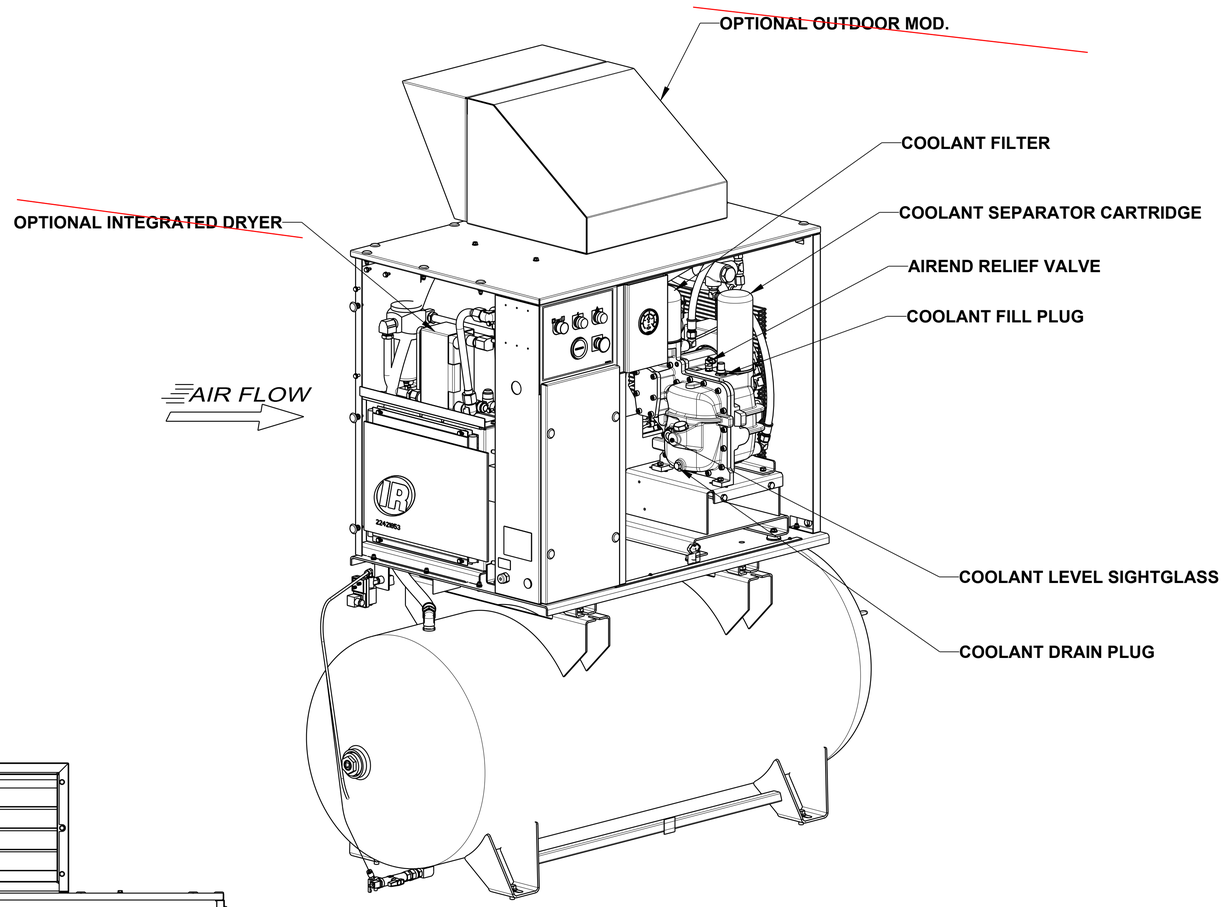


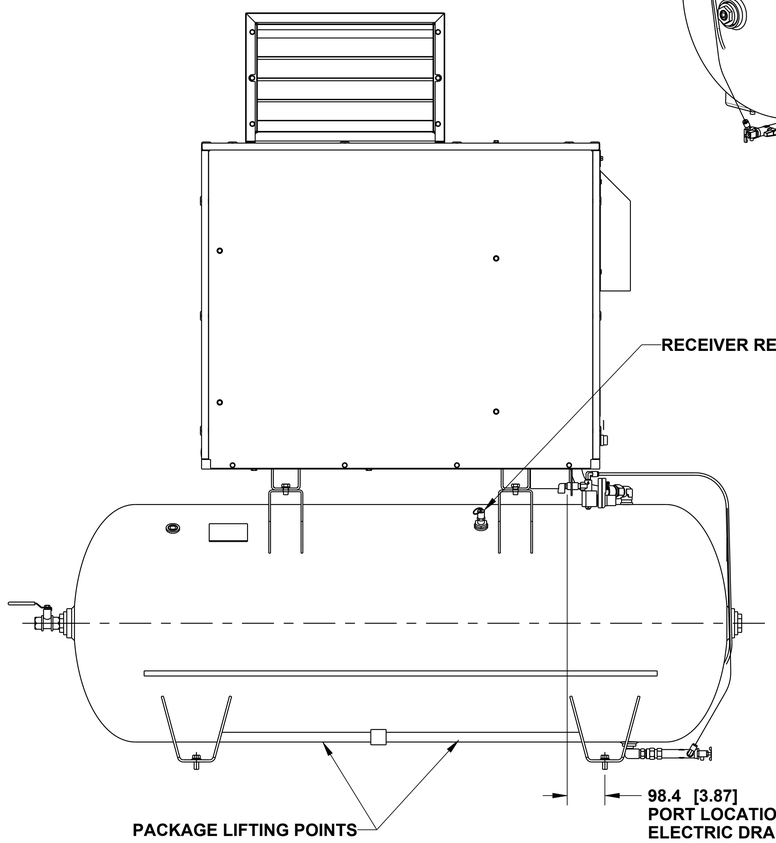


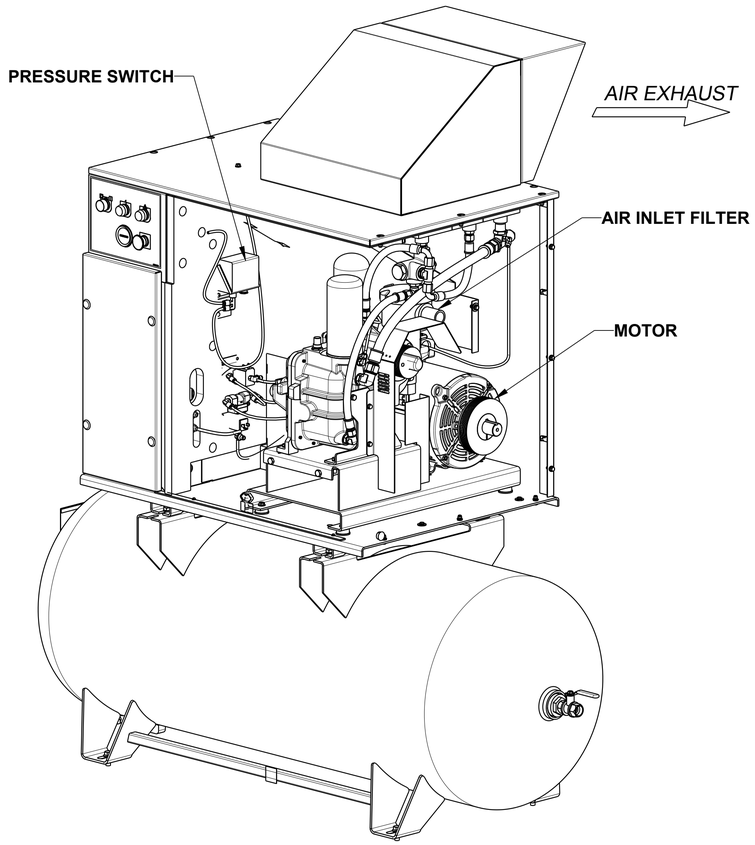


STANDARD TOLERANCES ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)] UNSPECIFIED TOLERANCES: WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0.25 ANGLES (.X) : ± 1° Ingersoll-Rand Industrial Technologies	WARNING: THE EXPORT OR REEXPORT OF THIS DRAWING OR A PRODUCT PRODUCED BY THIS DRAWING IS SUBJECT TO U.S. EXPORT ADMINISTRATION REGULATIONS AND OTHER APPLICABLE GOVERNMENT RESTRICTIONS OR REGULATIONS. PROPRIETARY NOTICE THIS DRAWING CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION, IS THE PROPERTY OF INGERSOLL-RAND CO., AND IS GIVEN TO THE RECEIVER IN CONFIDENCE. THE RECEIVER BY RECEPTION AND RETENTION OF THE DRAWING ACCEPTS THE DRAWING IN CONFIDENCE AND AGREES THAT, EXCEPT AS AUTHORIZED IN WRITING BY INGERSOLL-RAND CO. IT WILL (1) NOT USE THE DRAWING OR ANY COPY THEREOF OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; (2) NOT COPY THE DRAWING; (3) NOT DISCLOSE TO OTHERS EITHER THE DRAWING OR THE CONFIDENTIAL OR TRADE SECRET INFORMATION THEREIN; AND (4) UPON COMPLETION OF THE NEED TO RETAIN THE DRAWING, OR UPON DEMAND, RETURN THE DRAWING, ALL COPIES THEREOF, AND ALL MATERIAL COPIED THEREFROM.	DO NOT SCALE DRAWING DRAWING CONFORMS TO ASME Y14.5M - 1994 CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED UNLESS OTHERWISE SPECIFIED: - REMOVE ALL BURRS AND SHARP CORNERS - WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4 	THIRD ANGLE PROJECTION DRAWN VIJAY 2004JUN28 CHECKED G.HALLMAN 2004JUN28 APPROVED S.KUMAR 2004JUN28 B.WISE 2004JUN28 DRAWING TYPE General Arrangement Drawing NOMENCLATURE	Ingersoll Rand NAME GENERAL ARRANGEMENT UP-SERIES (120 GAL.) SIZE A1 · ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED) 0.0 kilogram · DWG NO. 22469191 · REVISION K PART NO. SCALE 0.13 · MODEL UP-SERIES · SHEET 1 OF 3

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
1-B2 1-B3 2-C2 3-D7	H	1117762	UPDATED DRAWING TO LATEST FORMAT. REMOVED 3/8" BSPP CONDENSATE DRAIN. REMOVED DIMS 30.8 AND 732.8. REMOVED PILOT VALVE, FILTER AND RELATED PARTS. DIM 81.0 WAS 101.0.	2016OCT07	H.AVINASH	C.FRAZIER
	J	1265482	UPDATED DIMENSIONS AS PER NEW BASE	2017SEP28	M.PRASHANT	C.FRAZIER
	K	1288357	UPDATED GROUP, DISCHARGE TUBE 42576082 UPDATED GROUP, RECEIVER 42568717	2018MAR20	M.PRASHANT	C.FRAZIER

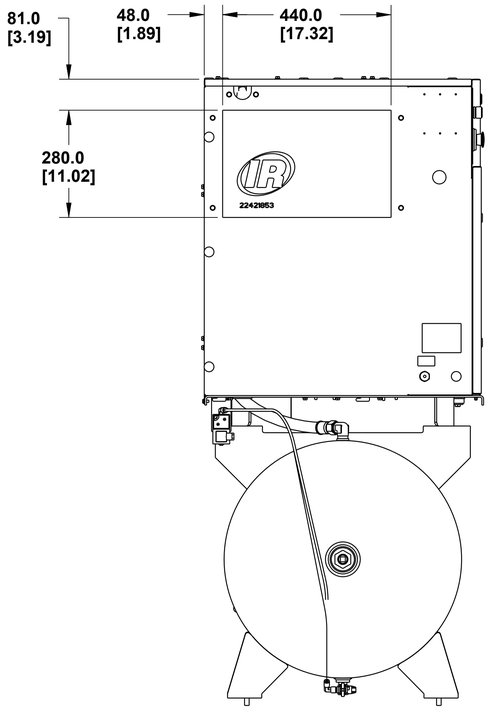




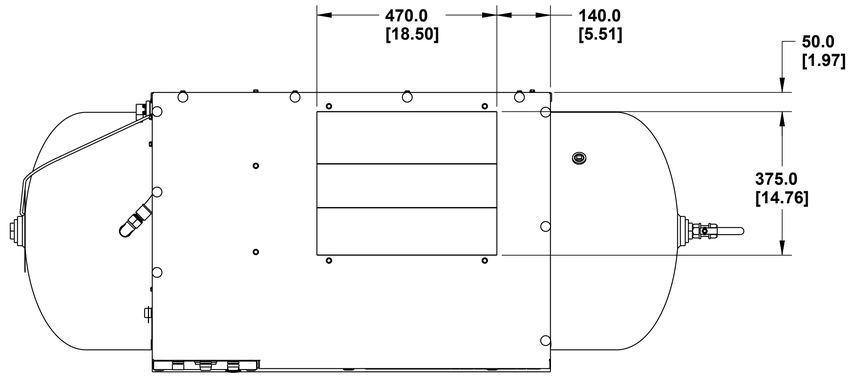


NAME
GENERAL ARRANGEMENT
UP-SERIES (120 GAL.)

SIZE	DWG NO.	REVISION
A1	22469191	K
SCALE 0.13	PART NO. / NOMENCLATURE	SHEET 2 OF 3



LEFT VIEW WITHOUT ODM ENCLOSURE

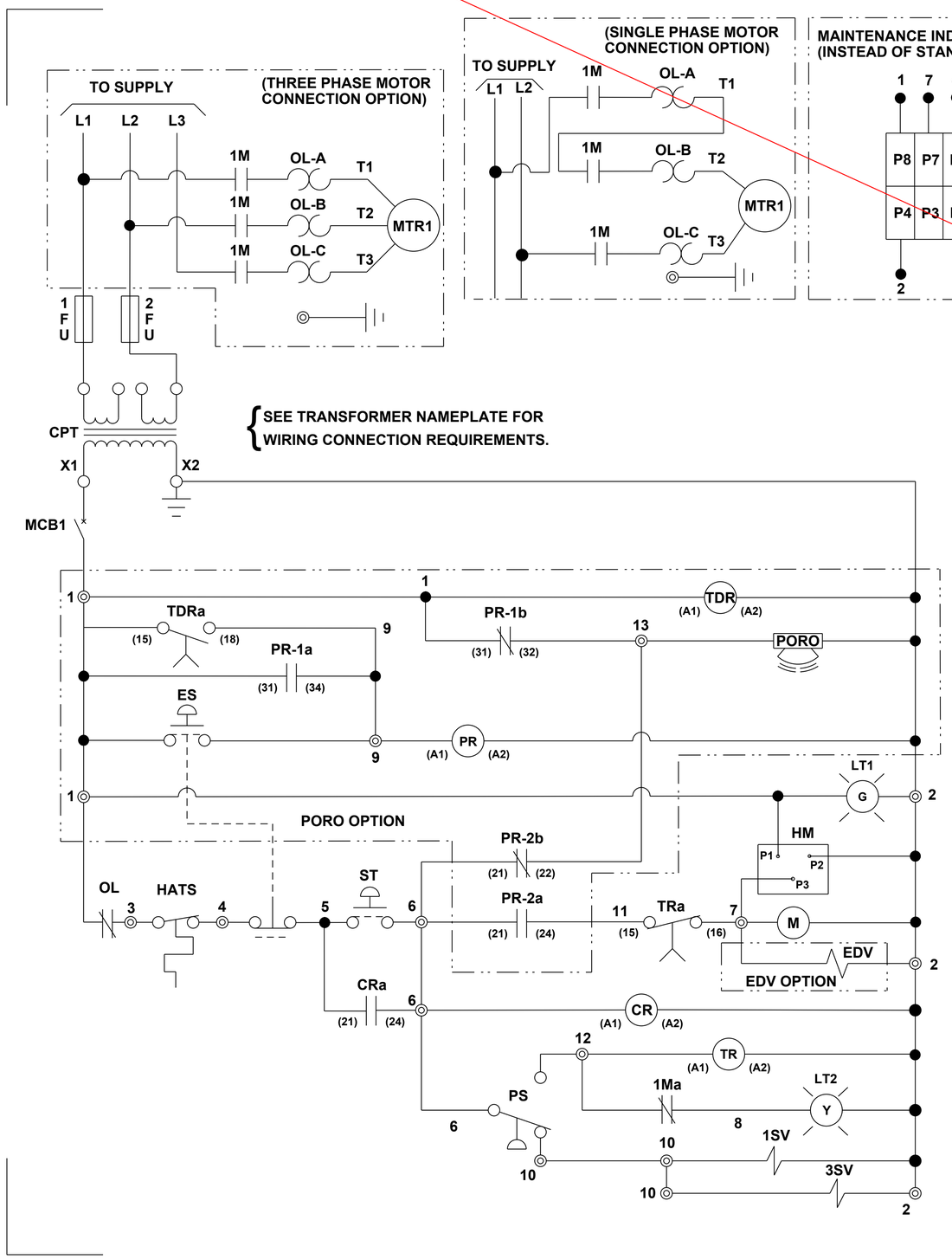


TOP VIEW WITHOUT ODM ENCLOSURE

NAME
GENERAL ARRANGEMENT UP-SERIES (120 GAL.)

SIZE	DWG NO.	REVISION
A1	22469191	K
SCALE 0.13	PART NO. / NOMENCLATURE	SHEET 3 OF 3

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APPROVED
	A	1265371	CANCELLED REVISION A	2017AUG28	B.SHASHANK	C.FRAZIER
	B		ORIGINAL RELEASE	2017SEP14	B.SHASHANK	C.FRAZIER



LEGEND	
CPT	TRANSFORMER, CONTROL 120/1/50-60
CR	RELAY, CONTROL
CRa	CONTACT, CONTROL RELAY
EDV	VALVE, ELECTRIC DRAIN 120/1/50-60
ES	EMERGENCY STOP
HATS	HIGH AIR TEMP SHUTDOWN
HM	METER, ELAPSED TIME
HM1	MAINTENANCE INDICATOR
LT1	LIGHT, POWER ON INDICATOR (GREEN)
LT2	LIGHT, AUTO RESTART INDICATOR (YELLOW)
M	COIL, MOTOR STARTER
MTR1	MAIN MOTOR
MTR2	DRYER MOTOR
OL	OVERLOAD, MOTOR STARTER
PORO	ALARM
PR	RELAY, PORO
PR-1a	RELAY, PORO CONTACT
PR-1b	RELAY, PORO CONTACT
PR-2a	RELAY, PORO CONTACT
PR-2b	RELAY, PORO CONTACT
PS	SWITCH, PRESSURE
ST	PUSH BUTTON, START
TDR	RELAY, TIME DELAY (PORO - 10 SEC.)
TDRa	CONTACT, TIME DELAY RELAY
TR	RELAY, RUN ON (6 MIN.)
TRa	CONTACT, RUN ON RELAY
1FU, 2FU	FUSE, PRIMARY
3FU, 4FU	FUSE, DRYER
1M	CONTACTOR, MAIN
1Ma, 1Mb	CONTACT, AUX. STARTER
1SV	SOL, LOAD
3SV	SOL, BLOW DOWN
MCB1	CIRCUIT BREAKER

47618055001 B

NOTES :

1. DECAL MUST CONFORM TO THE LATEST REVISION OF I-R SPECIFICATION 92-8.95.
2. CIRCUIT SHOWN IN NORMAL POSITION DE-ENERGIZED.
3. ALL WIRING TO BE MARKED IN ACCORDANCE WITH THIS SCHEMATIC.
4. ALL WIRING TO BE IN ACCORDANCE WITH NEC.

DO NOT SCALE DRAWING

DRAWING CONFORMS TO ASME Y14.5M - 1994

CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:
- REMOVE ALL BURRS AND SHARP CORNERS
- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4

THIRD ANGLE PROJECTION

DRAWN	B.SHASHANK	2017SEP14
CHECKED	B.NARENDRA	2017SEP14
APPROVED	C.H.FRAZIER	2017SEP14

DRAWING TYPE: Detail Drawing
NOMENCLATURE

Ingersoll Rand

NAME
DECAL, ELECT. SCHEMATIC UP6 5-15HP 1PH & 3PH DOL (N.A.)

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO.	REVISION
A1	-	47618055001	B
SCALE 0.25	MODEL UP-SERIES 5-15HP	PART NO.	SHEET 1 OF 1

NOTES :

1. FOR CUSTOMER CONNECTION SIZES AND LOCATIONS SEE FOUNDATION PLAN OF UNIT.
2. COMPONENTS INSIDE DOUBLE LINES ARE OPTION MODULE.

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
	A	80171	ORIGINAL RELEASE	2011OCT11	P.SADASHIV	B.LEWIS
2,C6	B	81962	DEFINED DRYER "BYPASS (OPTION)".	2013JUL29	OWANESIAN	C.H.FRAZIER
C1 D5	C	82594	TITLE BLOCKS, "SINGLE PHASE" REMOVED FROM TITLES. SHEET 1, ITEM 39 ADDED TO COMPONENT TABLE. SHEET 2, IN "AIR RECEIVER (OPTION)", ITEMS 17, 18 AND 39 ADDED.	2014MAR27	M.CURRY	C.H.FRAZIER T.VINCENT
1D4 1C8 1C4 1D3	D	82790	ADD LINE FROM BLOWDOWN SOL COIL POST TO ATMOSPHERIC VENT ON INLET VALVE TO ADDRESS ANY WEEPING FROM BLOW DOWN VALVE; AND ADD LINE FROM BLOW DOWN VALVE OUTLET TO INLET VALVE TO ASSIST CLOSING INLET VALVE. CORRECTED VIEW BY ATTACHING RELIEF VALVE TO SEP. TANK. UPDATED DRAWING FORMAT. ADDED FILTER SYMBOL AND LINE FOR CONDENSATE, REVISED LINE ROUTE FROM FILTER TO SOL BLOWDOWN VALVE, ADD FILTER TO TABLE #40	2014MAY21	R. REDMON K.CODY	C. FRAZIER
C3	E	1117762	REMOVED FILTER SYMBOL AND FILTER #40 FROM TABLE. REVISED LINE ROUTE FROM MPCV TO SOL BLOWDOWN VALVE AND SOL LOAD VALVE.	2016OCT06	H.AVINASH	C.FRAZIER
1C2	F	1288357	REMOVED DIAGRAM POSITION #26 VALVE, ISOLATION (OPTION)	2018MAR14	A.DHANA	C.FRAZIER
1D3	G		IN REVISION TABLE F WAS G.	2018APR24	A.DHANA	C.FRAZIER

DIAGRAM POSITION	DESCRIPTION
	KEY TO COMPONENT
39	VALVE, OUTLET
38	RECEIVER, AIR
37	VALVE, AUTO DRAIN
36	COMPRESSOR, REFRIGERANT
35	VALVE, HOT GAS BYPASS
34	CONDENSER
33	FILTER DRIER, REFRIGERANT
32	TUBE, CAPILLARY
31	VALVE, CONDENSATE
30	INDICATOR, DEW POINT
29	EVAPORATOR
28	VALVE, CHECK
27	MOISTURE SEPARATOR
26	
25	RECUPERATOR
24	VALVE, CHECK
23	FILTER, HIGH EFFICIENCY AIR
22	FILTER, GENERAL PURPOSE AIR
21	GAUGE, PRESSURE
20	VALVE, SOLENOID 1SV LOAD
19	SCREEN, SCAVENGE
18	VALVE, DRAIN
17	VALVE, RELIEF
16	DIFFUSER
15	COOLER, OIL
14	THERMOSTAT
13	FILTER, COOLANT
12	SWITCH, TEMPERATURE
11	SWITCH, PRESSURE
10	VALVE, SOL BLOWDOWN 3SV
9	AFTERCOOLER
8	VALVE, MINIMUM PRESSURE
7	TANK, SEPARATOR - FINE
6	TANK, SEPARATOR - COARSE
5	RELAY, MOTOR OVERLOAD
4	MOTOR
3	AIR END ASSEMBLY
2	VALVE, AIR INLET
1	FILTER, AIR

PIPING LEGEND
AIR/COOLANT
AIR
COOLANT
CONDENSATE
COMPONENT BOUNDARY
REFRIGERANT

CONTINUED ON SHEET 2

DO NOT SCALE DRAWING

DRAWING CONFORMS TO ASME Y14.5M - 1994

CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:
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- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4

THIRD ANGLE PROJECTION

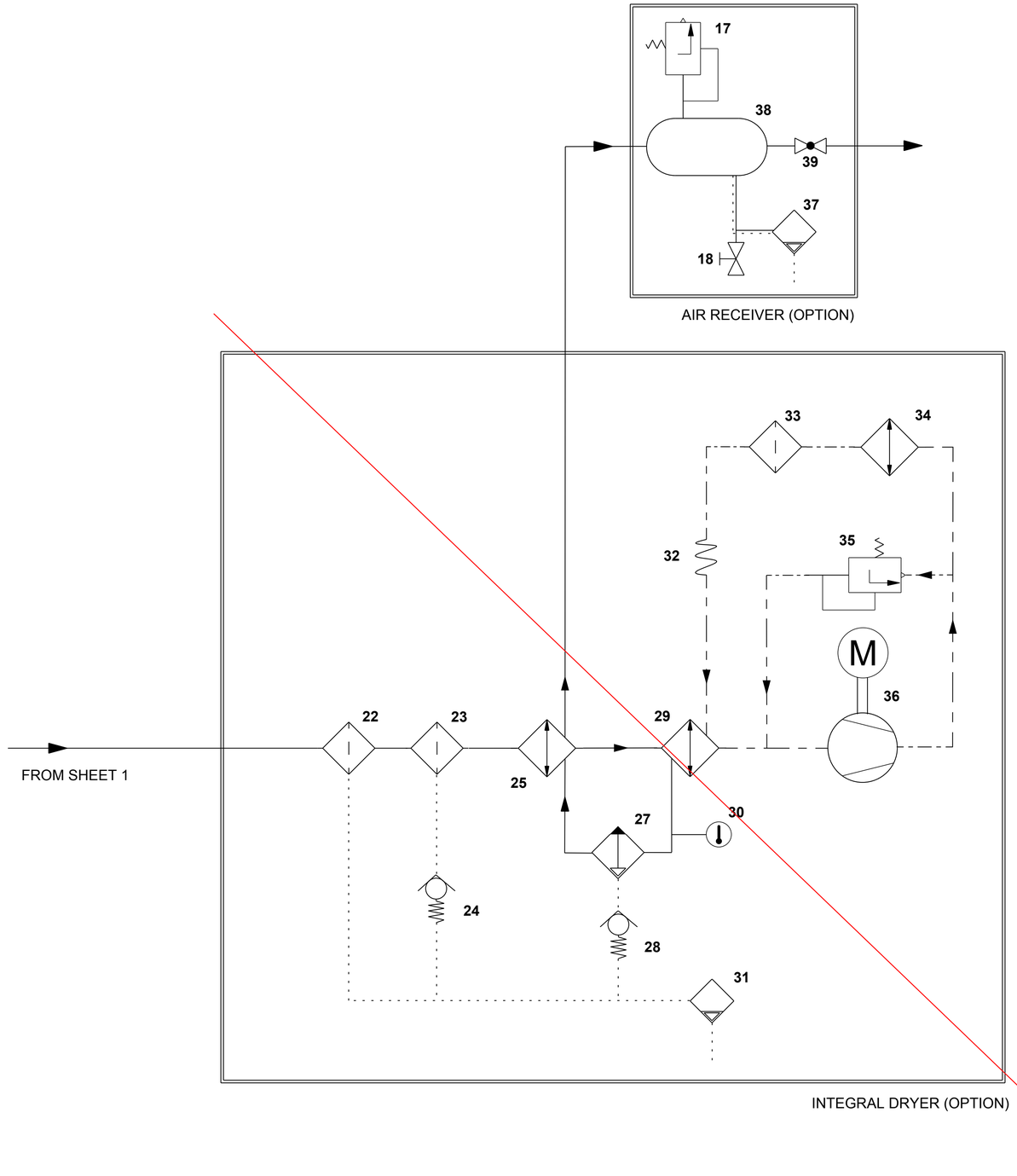
DRAWN	P.SADASHIV	DATE 2011OCT11
CHECKED	C. FRAZIER	DATE 2011OCT11
APPROVED	B. LEWIS	DATE 2011OCT11

DRAWING TYPE: Schematic Diagram
NOMENCLATURE

Ingersoll Rand

NAME: DIAGRAM, P & I, STANDARD CONTROL

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO.	REVISION
A1	DNA	23972649	G
SCALE 0.25	MODEL SMALL UP	PART NO.	SHEET 1 OF 2



NAME
DIAGRAM, P & I, STANDARD CONTROL

SIZE	DWG NO.	REVISION
A1	23972649	G
	PART NO.	
SCALE 0.25	NOMENCLATURE	SHEET 2 OF 2

UNLESS OTHERWISE SPECIFIED PRINTED DOCUMENT IS UNCONTROLLED

Ingersoll Rand
Industrial Technologies

SSR®
UP Series

CCN: 23754070
Rev: D
Ref: 9902
Sheet 110
Date: 04th June 2012
Cancels: 01st January 2011
ECN: 80803

Point of Manufacture – Campbellsville, KY, USA
SSR® UP6 - 5, 7.5, 10, & 15c
60Hz DETAIL DESCRIPTION

INLET AIR FILTER
Inlet air filtration for UP SERIES is accomplished through the use of a dry-type air cleaner, which is 99.9% efficient at 3 microns and above.

AIREND
Since the airend is the fundamental component in a rotary screw compressor package, reliability, performance and efficiency are determined by selection of the most effective design, maintenance of close manufacturing tolerances, and precise assembly of the airend itself. All UP Series units, apply proven airends achieving high levels of efficiency and durability.

A high efficiency asymmetrical profile is developed through a unique two-step machining process. The first stage develops the basic wrap angle profile and is a rough-cut. The final stage is a finish grinding process, which ensures a hard, true rotor surface. The rotor shafts are precision ground to tolerances within 12 microns (0.0005 of an inch). The rotor housings are made of high quality, close grain cast Iron.

Bearing configuration used on all Small UP series models is the tapered rollers thrust bearing and parallel roller journal bearing. These roller bearings are able to handle all loads, radial, thrust or a combination of both. With this bearing configuration, the discharge end of the male and female rotors are each equipped with a pair of tapered roller bearings offset at opposing axis for maximum positional stability and absorption of thrust and radial loads. The thrust bearing housing is made of a close grain cast iron.
Cylindrical roller bearings are used to carry the radial loads on the inlet end of the rotors. All bearings, whether thrust or radial, are premium specification, which provide truer, harder running surfaces for both inner and outer bearing races.
A double shaft seal is fitted on the main input shaft.

Coolant dams are machined at the bearing locations. This provides an area for coolant to accumulate when the compressor is shut off. Upon start-up the bearings, which are resting in coolant retained by the coolant dam is immediately lubricated, thereby assuring long life.

COOLANT RESERVOIR
A pre-separator is fully integrated with the airend forming a single module. The highly efficient separation system, combined with suitably sized sump volumes, provides for normal coolant top-up intervals of 500 hours. A pressure relief valve mounted on the housing protects the package. The coolant filler, is designed to prevent overfill the compressor, and a visual coolant level indicator is located on the side of the module. A drain point is provided at the bottom of the sump.

MAIN DRIVE MOTOR-GENERAL
The, main drive motor is matched to the requirements of the torque and the load of the compressor and to specific design criteria that enable the motor to develop peak efficiency and power factor at full load.

Double shaft construction with the cooling blower mounted on main shaft provides assured cooling.

MOTOR FRAME
Standard NEMA frame, 2 pole, E-pact efficiency rated open drip proof three phase motors are used for UP6 - 5, 7.5, 10 & 15 hp 60Hz applications. TEFC motors are supplied, when the optional NEMA-4 package is ordered. Single phase motors are available up to 7.5 hp.

ELECTRICAL DESIGN
Speed, torque and operating characteristics have been designed to match the load of the compressor. Motor efficiency and power factor have been optimised for each size over the entire capacity range of the UP6 - 5, 7.5, 10 & 15 hp. Standard motors are 230/460v 3 Phase 60 cycle and 208, 380, & 575 volt 3 phase motors are available as options. Single-phase motors are optional at 5 & 7,5 hp duties

MOTOR BEARINGS
Ball bearings for the drive and non-drive end provide dependable and reliable service both front and back bearings are permanently lubricated on both ODP and TEFC motors.

Ingersoll Rand
Industrial Technologies

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UP Series

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Point of Manufacture – Campbellsville, KY, USA
SSR® UP6 - 5, 7.5, 10, & 15c
60Hz DETAIL DESCRIPTION

MOTOR INSULATION
The selected motor has a minimum of class F insulation as standard, and is specified to operate in ambient conditions up to 104°F (40°C). In addition the motor is specified to operate at maximum load with a temperature rise some 27°F (15°C) below that permitted by the design code. This conservatism is frequently referred to as “Class F with class B temperature rise”

BELT DRIVE
The power transmission from the drive motor to the airend male rotor is by long life non-stretching poly-vee belt with easy to adjust belt tension control and simple access for maintenance. This assures performance integrity and belt life. The complete drive system is contained within a protective guarding.

COOLING SYSTEM

Coolant Filtration
The full capacity coolant filter is a high capacity 5-micron, replaceable spin-on element with pressure bypass.

Coolant / Lubricant Temperature Control
A thermostatic control valve is mounted downstream of the oil cooler. The temperature sensitive element controls the flow of coolant through the oil cooler. This provides the proper injection temperature and assures fast warm-up.

Coolant Injection
The coolant is injected through ports near the airend inlet and directed back toward the inlet cover. This ensures the best possible pre-sealing of the rotors, and an optimum mix of coolant with air. The differential pressure between the separator tank and the airend inlet induces coolant flow.

COOLANT / AIR SEPARATION
After compression and discharge from the airend, the air is heavily laden with coolant. A separator is used to remove the fluid from the air stream and does so with a three stage separation system. In the first stage, air and coolant mixture from the airend discharge directly enters the separator tank through a nozzle, which directs the mixture flow within the volume. This action forces heavier coolant particles to the periphery of the tank. These particles combine with the main liquid body in the sump. The airflow then passes through the cartridge coalescing element, which combines the second and third stage of separation. The separator cartridge is two-stage with reinforced construction. Coolant, which has collected at bottom of the cartridge is drawn back to the airend inlet through a scavenge system.

The compressed air then passes to the air-cooled aftercooler where coolant vapour carryover will be further removed as it is condensed and drained together with water condensate. On the SSR-UP 5-15 hp compressors, the carryover after the aftercooler is less than 5PPM (5 mg/m^3.)

Due to the conservative sizing of the air passages and the separator cartridge, there is a minimal pressure drop. This reduces to a minimum, power required to move the air through the compressor system.

A combined minimum pressure / check valve regulates the air discharge from the separator. This ensures that when the unit is unloaded, sufficient pressure is maintained in the tank to propel the coolant through the system. SSR UP series compressors are supplied with an inclusive factory fill of Ingersoll Rand Premium Compressor Coolant that provides extended operating life.

Ingersoll Rand Premium Compressor Coolant is a PAG synthetic lubricant, providing better cooling characteristics and a longer life than other synthetic lubricants. Condensate containing traces of the coolant fluid should be processed to meet local environmental requirements before disposal in approved manner.

COOLERS
SSR UP Series compressors come with integrally mounted air-cooled combination heat exchanger that cools both the coolant and compressed air and is of tube and fin design. Constructed from aluminium, it is designed to operate in ambient temperatures from 35°F (2°C) up to 104°F (40°C) The after cooler cools the compressed air to 18°F (10°C) above ambient air temperature at 104°F (40°C) and 60% RH. Centrifugal cooling fan is mounted in an internal segregated cooling compartment. Cooling air is forced across the cooler with even velocity over the full surface area of the cooler matrix.

The cooler assembly is accessed through a single opening, providing access to both sides of the cooler, for quick and effective cleaning.

Ingersoll Rand
Industrial Technologies

SSR®
UP Series

CCN: 23754070
Rev: D
Ref: 9902
Sheet 112
Date: 04th June 2012
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Point of Manufacture – Campbellsville, KY, USA
SSR® UP6 - 5, 7.5, 10, & 15c
60Hz DETAIL DESCRIPTION

PIPING
The compressor utilises flexible SAE hoses with JIC fittings, rigid steel piping, Bundy weld tubing, flexible connectors and nylon tubing as appropriate to provide vibration free operation. SAE "O" Ring fittings are applied on all lubricant connections. Each compressor system, after manufacturing and assembly, will be 100% inspected and tested to provide a piping system with minimum potential for leaks, which is easy for maintenance.

CONTROL PANEL – GENERAL
The SSR UP Series compressor includes a standard control module, which provides starting, stopping, capacity and pressure control, together with operating and safety control for the package.

Operation of the compressor is very simple and user friendly. The instrument panel is mounted on the front of the compressor, directly above the starter for good visibility when either floor or receiver mounted. The control panel includes: - Run/Stop selector switch and reset button, “lock off” emergency stop button, pressure gauge, running hour meter. Signal lights indicate: - power on (green), auto restart (amber).

COMPRESSOR/CAPACITY CONTROLS
As standard, SSR UP 5-15 hp is provided with automatic start / stop control with constant running control regulator, which allows the compressor to operate at 2 points on the capacity curve. The first is 100% full-flow. The second is no-flow. The online / offline auxiliary control is a constant running mode of operation and should be selected when load conditions require.

STARTER
The compressor has an integrally mounted, starter enclosure with full voltage starter and control transformer to 120V 60 Hertz control voltage. Motor overload protection is designed and sized to match the specific characteristics of the motor.

TEMPERATURE PROTECTION
Should the compressed air temperature exceed 228°F (109°C) at the airend discharge, a switch will shut down the compressor, and when provided with optional maintenance indicator will display the fault symbol.

BASEPLATE
A one piece folded mild steel, base-plate protected from corrosion with a high grade of powder coated paint finish, supports all of the components within the package The base-plate is provided with fork truck slots to enable easy handling from front or end of the package. The compressor unit and drive motor are mounted on a secondary sub-base which is supported on vibration isolating mounts, which reduces operating sound emissions to a very low level.

ENCLOSURE
The package enclosure is carefully designed to provide effective sound emission control and suppression, whilst retaining easy access for maintenance and eventual refurbishment.
The front door lifts off if required to provide easy access to all routine maintenance points. This door provides easy access to carry out the following maintenance procedures

- Check and top up coolant
- Check intake filter condition
- Change intake filter
- Change coolant filter
- Change separator cartridge
- Service Intake valve
- Check or adjust constant running valve
- Check shuttle valve
- Drain & refill coolant
- Adjust belt tension
- Set and adjust load and unload operating pressures

Package Pre-Filter
The cooling airflow is pre-filtered through an easy to clean filter panel, which protects the cooler matrix from heavy dirt ingress and reducing maintenance requirement.

Starter
The starter is accessed through a single front panel, which provides access to all starter components.

Drive System
The drive belt system is accessed by removal of the end panel.

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Point of Manufacture – Campbellsville, KY, USA
SSR® UP6 - 5, 7.5, 10, & 15c
60Hz DETAIL DESCRIPTION

Cooler cleaning
Cooler cleaning operations are simplified by removing the rear panel, which provides easy access to the inside face of the cooler.
Inlet Duct and or discharge duct can easily be connected to the machine to single point connections.
Back pressure provision available for cooling airflow is ¼" (6 mm) water gauge

HIGH AMBIENT PACKAGE (Optional)
Rated for operation in ambient conditions up to 122°F (50°C) and as low as 35°F (2°C) The High Ambient units are available in power sizes of 5. 7.5 10 hp with capacities from 16 through 38 CFM and pressures 125, 150 and 210 PSIG

SERVICE/MAINTENANCE INDICATOR (Optional)
Advanced but simple indicator, that is highly visual and includes the following -

- Hour meter
- Maintenance indicator - bar graph continuously indicates remaining service life
- Indicator of Fault condition
- Real time clock
- Back light
- Service due warning
- Service overdue

FULL NEMA IV PACKAGE (Optional)
This combination option is intended for those installation conditions requiring high resistance to dust and or high humidity. This option includes NEMA IV starter cabinet, conduit and internal glands, TEFC main motor.

Modular Desiccant Dryer

Model DA100IM

Qty: 1

Ingersoll Rand
Inspiring Progress™

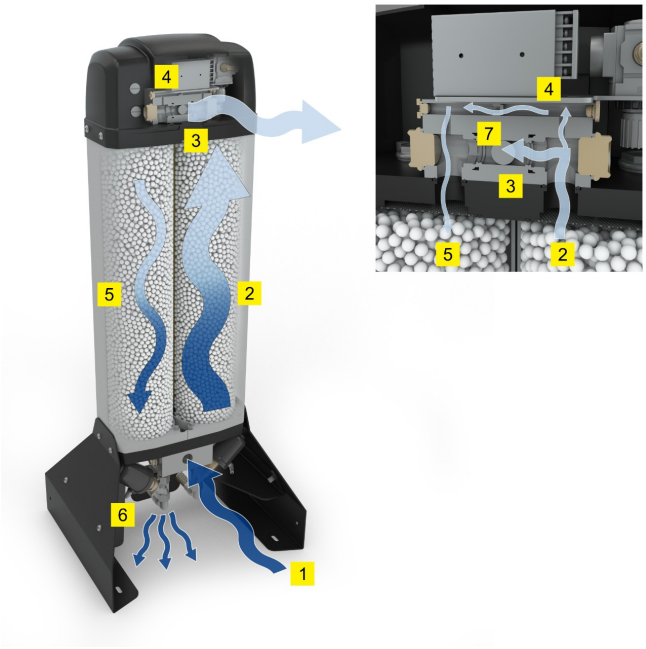
Modular Heatless Desiccant Dryers 5-300 m3/h (3-176 SCFM)

Our innovative modular desiccant dryers are compact, fully integrated units ideal for point of use applications, so you only pay to dry the air required for your operation. The dryers deliver ISO Class 2 dew point performance, with optional ISO Class 1, to help prevent corrosion and minimize production disruptions and losses due to moisture or contamination.

Features

- **High Air Quality:** High-performance desiccant technology delivers ISO Class 2 or Class 1 pressure dew point air for critical applications; high efficiency pre-filter and general purpose after-filter protect desiccant and downstream air from oil contamination and particulates.
- **Reliable Operation:** High-strength desiccant, durable valves and components and long cycles extend equipment life.
- **Reduced Energy Use:** Low pressure drop design saves on energy costs and provides an economical drying solution. Energy Management System option for further energy use reduction.
- **State-of-the-Art Control:** Easy to use, advanced microprocessor with visual display showing data in real time to maintain dryer performance at optimum levels, providing preventative maintenance alerts as well as protection notifications for efficiency and connectivity. *Applies to models DA40IM and up
- **Easy Installation and Maintenance:** With a compact footprint and low noise operation, modular dryers are suitable to be quickly installed right in the work environment and easy maintained, with preventative maintenance alerts

HOW IT WORKS



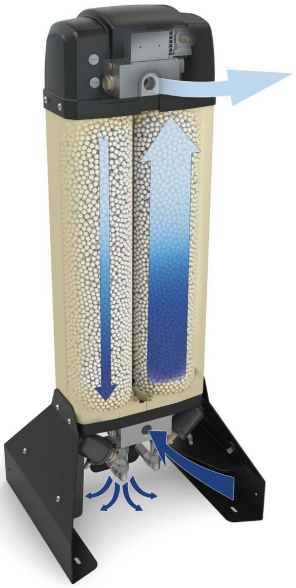
DRYING PROCESS

- Compressed air stream with moisture enters the dryer from inlet valve, depending where the PLC sequence step is, this will be either the left or right column
- The compressed air gets dried going upward in the column through the desiccant media that adsorb water vapor
- From the exit valve, the dried air is delivered to the air system

REGENERATING PROCESS

- Simultaneously to drying the compressed air in the other column, a limited amount of dried air is passed from the upper outlet valve and expanded to atmospheric pressure through purge orifice housed within the valve, to the regenerating column
- This regeneration air flows downwards through the saturated desiccant of the other column and regenerates the desiccant by adsorbing the moisture
- The expanded regeneration air containing the adsorbed moisture is discharged through the exhaust solenoid valve and muffler
- The sphere in the valve and its position, right or left, determines which column is drying and regenerating. The movement of the sphere is driven by the pressure difference between the columns (pressure for drying column and atmospheric pressure for regenerating column) driven by exhaust solenoid valves in the bottom part of the dryers

HOW IT WORKS



Drying process

1 Compressed air stream with moisture enters the dryer from inlet valve, depending where the PLC sequence step is, this will be either the left or right column
2 The compressed air gets dried going upward in the column through the desiccant media that adsorb water vapor
3 From the exit valve, the dried air is delivered to the air system

Regenerating process

4 Simultaneously to drying the compressed air in the other column, a limited amount of dried air is passed from the upper outlet valve and expanded to atmospheric pressure through purge orifice housed within the valve, to the regenerating column
5 This regeneration air flows downwards through the saturated desiccant of the other column and regenerates the desiccant by adsorbing the moisture
6 The expanded regeneration air containing the adsorbed moisture is discharged through the exhaust solenoid valve and muffler
7 The sphere in the valve and its position, right or left, determines which column is drying and regenerating. The movement of the sphere is driven by the pressure difference between the columns (pressure for drying column and atmospheric pressure for regenerating column) driven by exhaust solenoid valves in the bottom part of the dryers

MODULAR DESICCANT DRYER
DA5IM - DA300IM (-40°F)

Industrial Technologies

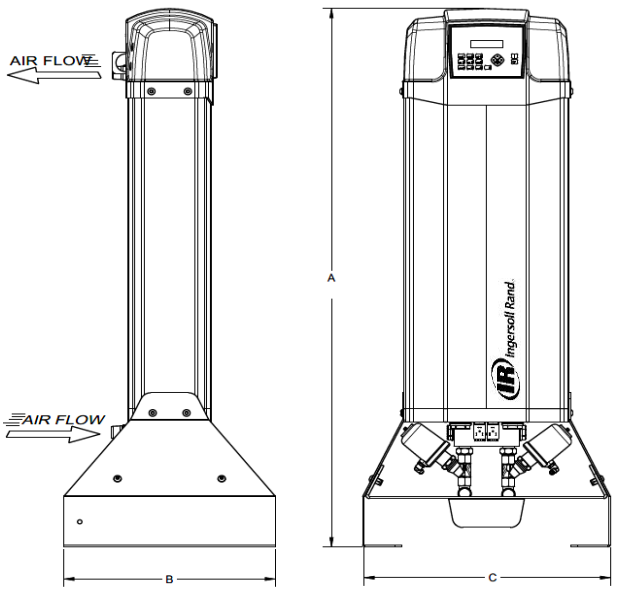
CCN: 47682258001
DATE: 10/4/2019

ENGINEERING DATA

	DA5IM	DA15IM	DA25IM	DA40IM	DA55IM	DA70IM
Product part number	47675073001	47675074001	47675075001	47675076001	47675077001	47675078001
-40°C Inlet Capacity (scfm)	3	9	15	24	32	41
Purge (scfm)	0.5	1.6	2.7	4.2	5.8	7.4
Desiccant per Tower (lbs)	1.5	4.7	6.6	14.1	18.4	24.0
Electrical	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
Air In/Out Connections NPT	3/8"	3/8"	3/8"	3/4"	3/4"	3/4"
C - Width (inch)	9.4	9.4	9.4	18.7	18.7	18.7
B - Depth (inch)	8.3	8.3	8.3	15.9	15.9	15.9
A - Height (inch)	16.7	32.4	42.2	38.1	44.0	51.9
Weight (lbs)	24.2	39.7	59.5	97.0	110.2	132.2

	DA100IM	DA150IM	DA200IM	DA250IM	DA300IM
Product part number	47675079001	47675080001	47675081001	47675082001	47675083001
-40°C Inlet Capacity (scfm)	59	88.5	118	147.5	177
Purge (scfm)	10.6	15.9	21.2	26.6	31.9
Desiccant per Tower (kg)	33.9	39.6	67.9	79.1	79.1
Electrical	115/1/60	115/1/60	115/1/60	115/1/60	115/1/60
Air In/Out Connections NPT	1"	1"	1.5"	1.5"	1.5"
C - Width (inch)	18.7	18.7	21.1	21.1	21.1
B - Depth (inch)	15.9	15.9	19.5	19.5	19.5
A - Height (inch)	65.9	73.7	67.1	75.0	75.0
Weight (lbs)	160.9	198.4	390.1	396.7	414.4

Capacity on all models is based on 100ºF, 100 psig.
Maximum allowable inlet temperature is 120ºF
Minimum ambient temperature 35°F
Maximum ambient temperature 115°F
Minimum inlet pressure 60 psig
Maximum inlet pressure 200 psig.
Cycle time for -40ºF is 10 min. / 5 min. each vessel.
Inlet/Outlet filters H/G grade supplied loose with fittings

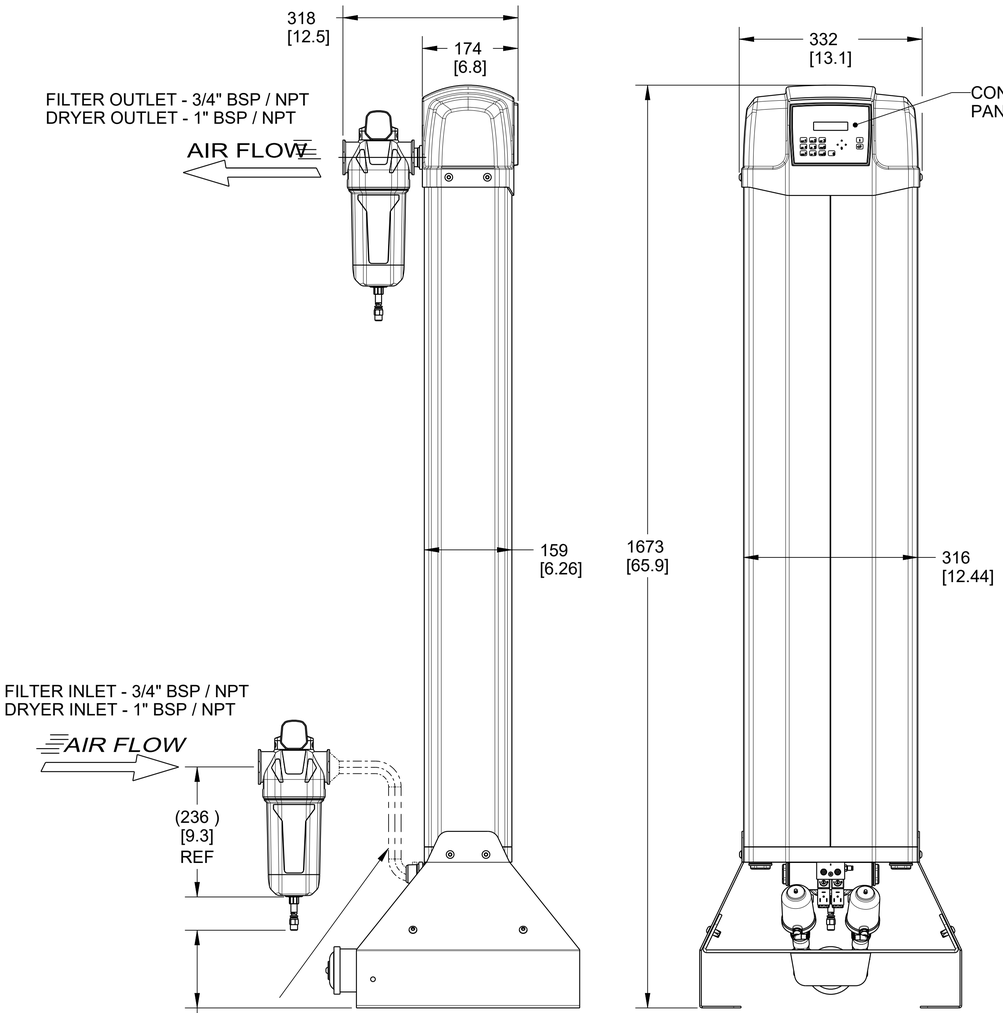


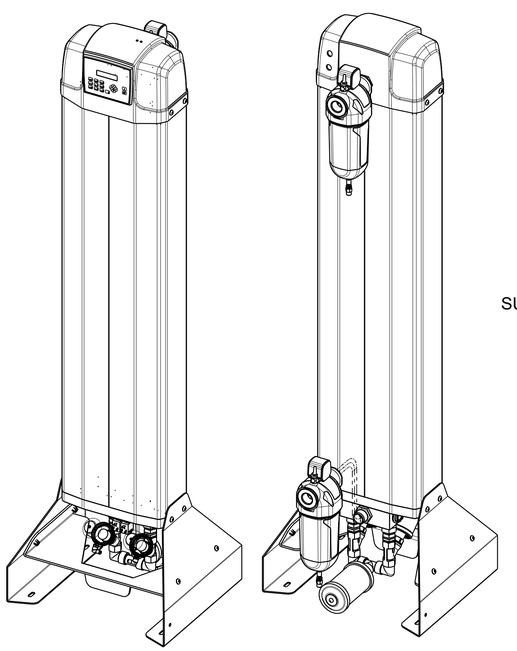
NOTES:

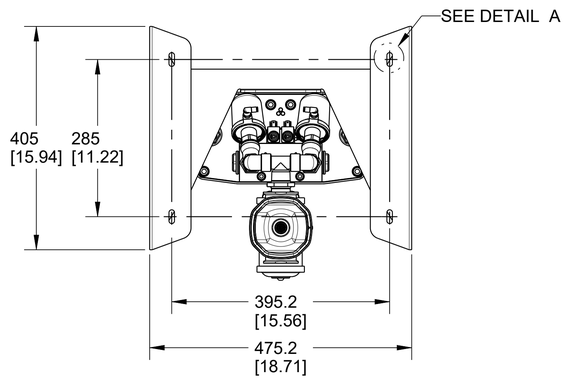
1. INSTALL THE DRYER ON A CLEAN AREA THAT HAS GOOD AIRFLOW. THE INSTALLATION SURFACE MUST BE HARD AND FLAT.
2. MAKE SURE THAT THE PRODUCT IS POSITIONED SECURELY AND ON A STABLE BASE. ANY RISK OF MOVEMENT SHOULD BE REMOVED BY SUITABLE MEANS TO AVOID STRAIN ON CONNECTED PIPING.
3. GIVE A MINIMUM OF 500mm [20"] SPACE ALL AROUND THE DRYER FOR NORMAL OPERATION AND MAINTENANCE.

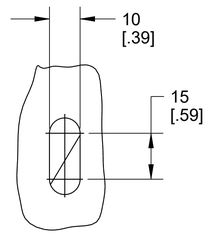
TECHNICAL NOTES:

1. MINIMUM PRESSURE: 4 BARG (58 PSI)
2. MAXIMUM PRESSURE: 14 BARG (203 PSI)
3. MINIMUM AMBIENT TEMPERATURE: 2° C (35 ° F)
4. MAXIMUM AMBIENT TEMPERATURE: 46 ° C (114.8 ° F)
5. VOLTAGE: 230 V, 50-60 Hz (115V, 60 Hz)
6. FILTERS: FA110H & FA110G (SUPPLIED & SHIPPED LOOSE)









DETAIL A
SCALE 1.000
MOUNTING HOLES
(AT 4 PLACES)

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APPROVED
	A	1362234	ORIGINAL RELEASE	2019SEP23	K.BHARATH	J.JAKOP

CCN	MODEL	CONNECTION TYPE	CAPACITY		WEIGHT
			m3/h	SCFM	
47659207001	DA100IM, -40° C	BSP	100	59	73 kg
47677628001	DA100IM, -40° C EMS	BSP	100	59	73 kg
47677672001	DA100IM, -70° C	BSP	80	47	73 kg
47675079001	DA100IM, -40° F	NPT	100	59	161 lbs
47677661001	DA100IM, -40° F EMS	NPT	100	59	161 lbs
47677705001	DA100IM, -100° F	NPT	80	47	161 lbs

THESE VIEWS ARE SHOWN FOR REFERENCE ONLY

SCALE 0.125

MFR NAME	ADDRESS	PART NO.
SUGGESTED SOURCES OF SUPPLY		

VENDOR ITEM DRAWING

STANDARD TOLERANCES	
ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]	
UNSPECIFIED TOLERANCES:	
WHOLE : ± 3	
ONE PLACE (.X) : ± 0.5	
TWO PLACE (.XX) : ± 0.25	
ANGLES (.X) : ± 1°	
Ingersoll-Rand Industrial Technologies	

DO NOT SCALE DRAWING

DRAWING CONFORMS TO ASME Y14.5M - 1994

CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:
- REMOVE ALL BURRS AND SHARP CORNERS
- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4

THIRD ANGLE PROJECTION

DRAWN	K.BHARATH	2019SEP23
CHECKED	J.JAKOP	2019SEP23
APPROVED	J.JAKOP	2019SEP23

DRAWING TYPE: Detail Drawing
NOMENCLATURE

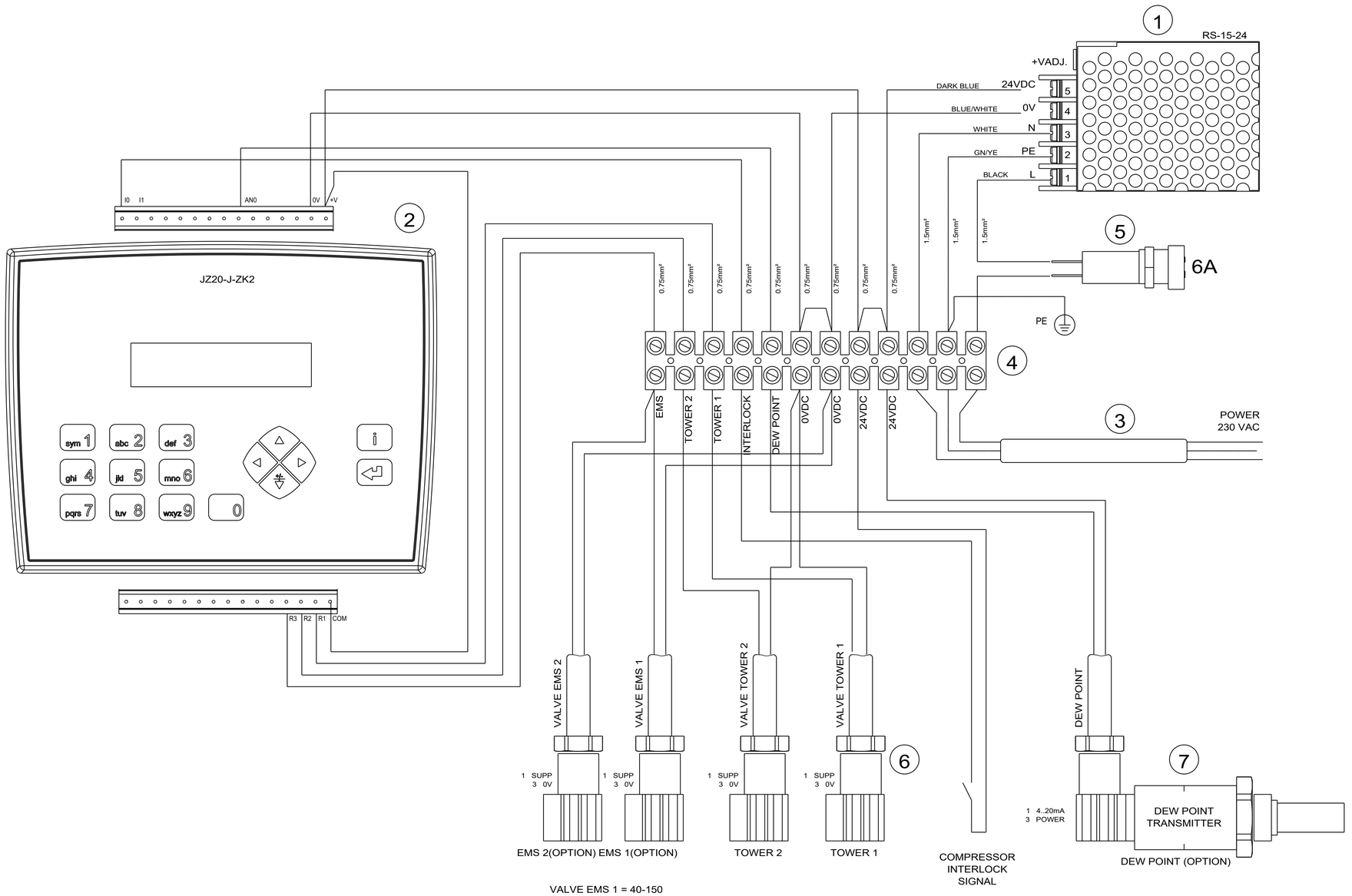
Ingersoll Rand

NAME

DA100IM, HEATLESS DRYER

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO.	REVISION
A1	0.0 kilogram	47679878001	A
SCALE 0.18	MODEL	PART NO.	SHEET 1 OF 1

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APPROVED
	A	1368654	ORIGINAL RELEASE	2019SEP30	K.BHARATH	J.JAKOP
	B	-	CANCELLED	-	-	-
	C	1388522	CIRCUIT DESIGN REVISED, TABLE REVISED, MANUFACTURER NAME CHANGED	2020JAN08	K.BHARATH	J.JAKOP



VALVE EMS 1 = 40-150
VALVE EMS 2 = 200-300

Pos.	DESCRIPTION	CODE	QTY.
1	POWER SUPPLY 230VAC, 24VDC 15W	RS-15-24	1
2	JAZZ 20 PLC+HMI	JZ20-J-ZK2	1
3	POWER CORD H05VV-F/SJT 3G 1.5mm²	28039	1
4	TERMINAL BLOCK, 10x2.5mm²	BM 9200	1
5	FUSE HOLDER	866-3454	1
6	SOLENOID VALVE		3
7	DEW POINT	EA2-TX-100-HD	1

PLURIFILTER		
MFR NAME	**ADDRESS**	**PART NO.**
SUGGESTED SOURCES OF SUPPLY		

VENDOR ITEM DRAWING

STANDARD TOLERANCES
ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]
UNSPECIFIED TOLERANCES: WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0,25 ANGLES (.X) : ± 1°
Ingersoll-Rand Industrial Technologies

DO NOT SCALE DRAWING

DRAWING CONFORMS TO ASME Y14.5M - 1994

CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:
- REMOVE ALL BURRS AND SHARP CORNERS
- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4

THIRD ANGLE PROJECTION

DRAWN	K.BHARATH	DATE 2019SEP30
CHECKED	J.JAKOP	DATE 2019SEP30
APPROVED	J.JAKOP	DATE 2019SEP30

DRAWING TYPE: Detail Drawing
NOMENCLATURE

Ingersoll Rand

NAME

DA40IM-DA300IM, ELECTRICAL SCHEMATIC

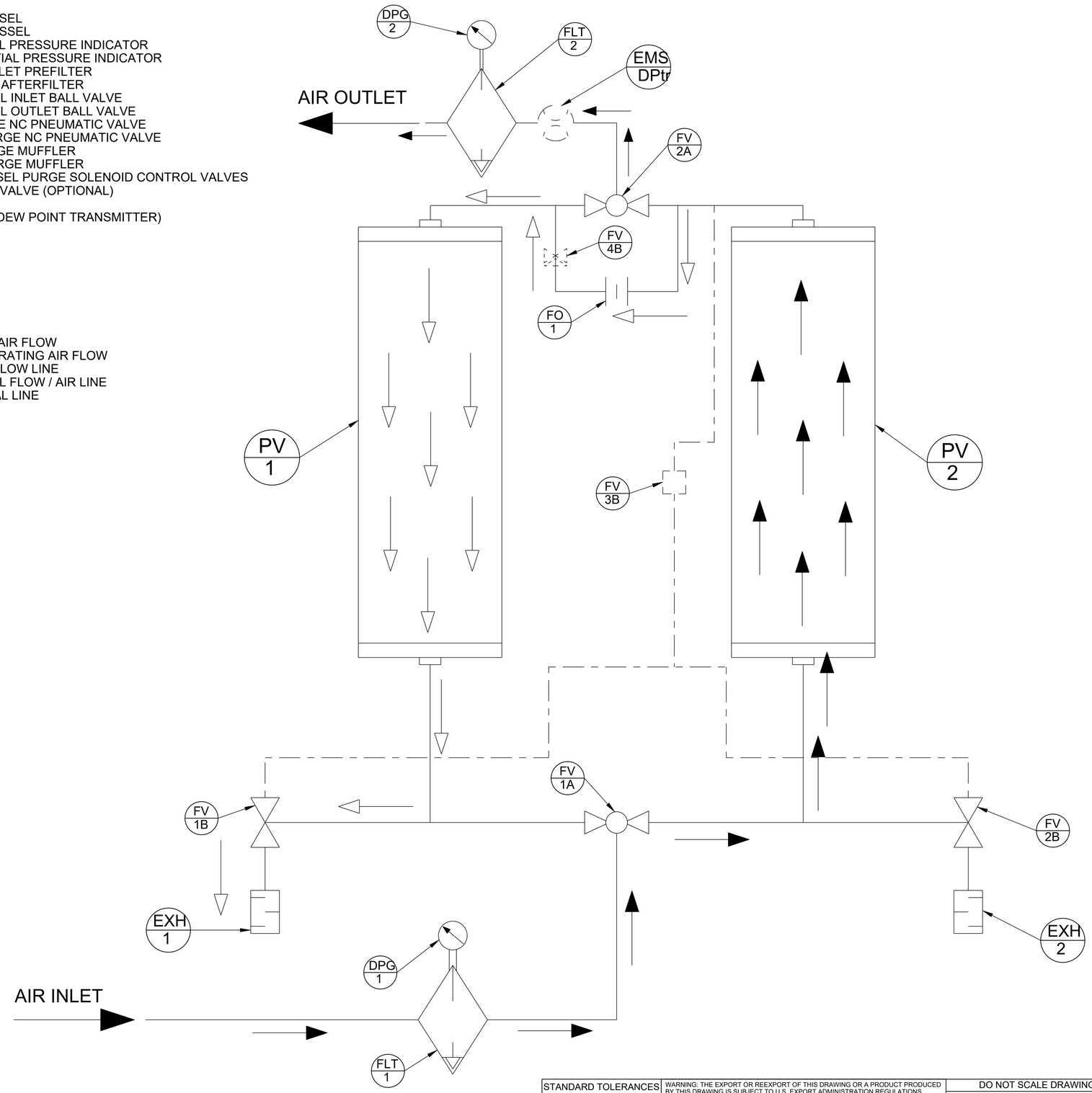
SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO.	REVISION
A1	0.0 kilogram	47680472001	C
SCALE 0.20	MODEL	PART NO.	SHEET 1 OF 1

REVISIONS						
ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APPROVED
	A	1392850	ORIGINAL RELEASE	2019AUG22	K.BHARATH	J.JAKOP

LEGEND:

1) PV-1: LEFT PRESSURE VESSEL
2) PV-2: RIGHT PRESSURE VESSEL
3) DPG-1: INLET DIFFERENTIAL PRESSURE INDICATOR
4) DPG-2: OUTLET DIFFERENTIAL PRESSURE INDICATOR
5) FLT-1: HIGH EFFICIENCY INLET PREFILTER
6) FLT-2: GENERAL PURPOSE AFTERFILTER
7) FV-1A: LEFT / RIGHT VESSEL INLET BALL VALVE
8) FV-2A: LEFT / RIGHT VESSEL OUTLET BALL VALVE
9) FV-1B: LEFT VESSEL PURGE NC PNEUMATIC VALVE
10) FV-2B: RIGHT VESSEL PURGE NC PNEUMATIC VALVE
11) EXH-1: LEFT VESSEL PURGE MUFFLER
12) EXH-2: RIGHT VESSEL PURGE MUFFLER
13) FV-3B: LEFT & RIGHT VESSEL PURGE SOLENOID CONTROL VALVES
14) FV-4B: EMS CONTROLING VALVE (OPTIONAL)
15) FO-1: PURGE ORIFICE
16) EMS- DP tr: EMS OPTION (DEW POINT TRANSMITTER)

: DRYING AIR FLOW
: REGENERATING AIR FLOW
: DRYER FLOW LINE
: CONTROL FLOW / AIR LINE
: OPTIONAL LINE



STANDARD TOLERANCES
ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]
UNSPECIFIED TOLERANCES:
WHOLE : ± 1 ONE PLACE (.X) : ± 0.5 TWO PLACE (.XX) : ± 0.25 ANGLES (.X) : ± 1°
Ingersoll-Rand Industrial Technologies

DO NOT SCALE DRAWING
DRAWING CONFORMS TO ASME Y14.5M - 1994
CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED
UNLESS OTHERWISE SPECIFIED:
- REMOVE ALL BURRS AND SHARP CORNERS
- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI/AWS A2.4

THIRD ANGLE PROJECTION

DRAWN	K.BHARATH	2019AUG22
CHECKED	P.PRABHU	2019AUG22
APPROVED	J.JAKOP	2019AUG22

DRAWING TYPE: Detail Drawing
NOMENCLATURE

Ingersoll Rand

NAME: **FLOW DIAGRAM, DA40IM-DA150IM**

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DWG NO. / PART NO.	REVISION
A1	0.0 kilogram	47668885001	A

SCALE 0.65 | MODEL | SHEET 1 OF 1

DA40IM – DA300IM
MODULAR DESICCANT DRYERS
40-300 m3/h, 24-177 SCFM

Point of Manufacture – Logatec, Slovenia

Date: August 29, 2019
Revision 0

CCN: 47681968001

MODULAR DESICCANT DETAILED SPECIFICATION

General Description
The Ingersoll Rand Modular dryer is a heatless modular dryer comprising of two (4 from model DA200IM and above) extruded aluminum columns filled with desiccant material which are assembled together using a bottom inlet and top outlet manifold which allows the design to meet varying capacity requirements.

One column (2 from DA200IM and above) is in operation (drying) while the opposite column (2 from DA200IM and above) is regenerating using the pressure swing adsorption (PSA) method.

A small volume of the dried compressed air is used to regenerate the saturated desiccant bed by expanding dried air from line pressure to atmospheric pressure, removing the water adsorbed by the desiccant material, and therefore, regenerating the dryer.

The desiccant columns are repeatedly regenerated and brought on-line using a PLC controlled sequence.

Operating Limitations
The Ingersoll Rand Modular desiccant dryer operates in the 40 to 300m3/h (24 to 177 SCFM) air flow range. Maximum operating pressure is 14 Barg (200 psig). Maximum inlet temperature for all models is 50°C (122°F). All models are designed to perform in conformance with ISO 8573 standards.

General Purpose
The Ingersoll Rand Modular desiccant dryer is designed to remove water vapor from compressed air for critical applications. This dryer is designed for indoor use with ambient temperatures above 2°C (35°F).

Adsorption System
As a standard, all models use activated alumina for adsorbing the moisture from the compressed air. For optional -70°C (-100°F) dew points activated alumina and molecular sieve are used in different proportions.

Switching Valves
For continuous operation the compressed air stream is automatically cycled between two desiccant columns, one adsorbing while the other is being regenerated. On all models this cycling is done by the use of solenoid valves.

Desiccant Towers
The heart of all adsorption dryers is the desiccant column. For continuous operation two columns are situated in parallel utilizing a common aluminum manifold.. All models use this high tensile extruded aluminum column design.

Desiccant
Replacement of the desiccant is generally recommended after 3 years. Routine media checks ensure proper performance. Yearly desiccant sample analysis is recommended.

Control and Instrumentation
The continuous switching between the desiccant columns is controlled by a PLC sequence. Energy Management System - EMS is optional. Pressure gauges are provided for both towers.

Enclosure
The PLC is contained inside a flame retardant ABS enclosure housing.

Filtration
A high efficiency coalescing pre-filter and general purpose post-filter are supplied loose with fitting.

Fundamentals of Air Drying
How Water gets into the Air System
Water vapor becomes a major constituent in compressed air systems as it is distributed with the compressed air. Additional cooling of the compressed air as it is distributed in the plant air piping will condense the water vapor. This condensed water will corrode system components resulting in increased maintenance costs and reduced system efficiency. The Ingersoll Modular air dryer will adsorb the water of the air system before problems develop. All atmospheric air contains a certain quantity of water vapor, which is mixed with other gases such as nitrogen, oxygen, carbon monoxide. This water vapor is drawn into the compressor with the incoming air during the compression cycle.

Compressed air, at normal ambient temperatures, cannot hold as much water vapor as air at atmospheric pressure, however, the heat generated during the compression cycle increases its ability to hold water vapor. When the compressed air is cooled between the compressor and the point of use, this water vapor will condense out in the system piping, air receiver, tools etc. The quantity of water vapor condensed will be that amount which is in excess of the saturated temperature of the compressed air.

Aftercooling

Almost every air system uses an after cooler (air cooled or water cooled) to cool compressed air as it exits the air compressor. The air exiting the compressor is typically at 95°C (204°F) to 180°C (365°F), depending on the type of compressor. The after cooler will cool the air to approximately 9°C (15°F) above the cooling medium, depending on the temperature of cooling water or cooling air. In almost all cases, the air exiting the after cooler is saturated, meaning it cannot hold any additional water vapor at its present temperature and pressure. Any decrease in compressed air temperature will result in water vapor condensing into the air system.

Types of Dryers

Depending on the application and the physical laws of nature, further moisture can be removed by the correct dryer selection. Two types of dryers are commonly used to remove moisture from compressed air, each with capabilities and limitations. These capabilities must match with end user requirements.

Refrigeration dryers cool the air by mechanical refrigeration to condense entrained water vapor; a moisture separator removes the condensate. Drying capabilities are in the 2 to 10°C (35 - 50°F) pressure dew point range. Since the lowest limit to which refrigeration dryers can perform without damage of freezing is 2-3°C (35-37°F), this type of dryer gives an excellent protection for installations where ambient temperatures remain above the freezing temperature of water.

Desiccant dryers are most suitable for any application that requires a pressure dew point below 0°C (32°F). When air-line freeze ups must be prevented or in critical processing, these dryers are commonly used. Desiccant dryers use porous, non-consumable materials (desiccant) to adsorb water molecules from the air stream onto the surface of the desiccant. The adsorption principle is based on the affinity of the desiccant with the water. The desiccant can adsorb a certain quantity of moisture after which it needs to be regenerated (dried out) for re-use. To allow continuous operation, the air stream is automatically cycled between two desiccant towers; one tower is adsorbing moisture while the other tower is being regenerated. The means of regeneration differentiates the types of desiccant dryers.

Dryer Operation

Compressed Air Flow

100% saturated compressed air enters the dryer via the inlet valve and is directed up through the drying column/s depending on where the PLC sequence step is, this will be either the left column/s or right column/s).

During its flow, water vapor is adsorbed from the air. The adsorption is based on the affinity of the desiccant material towards the water vapor in the air. One of the exhaust solenoid valves will be open and the other closed (again depending on the cycle position). This normally will be open for 4 minutes and 10 seconds and then closed for the same amount of time (continuous operation). This continuous cycling is controlled by a PLC.

Regeneration Air Flow

Simultaneously to drying the compressed air in the other column/s, a limited amount of dried air is passed from the dryer outlet and expanded to atmospheric pressure through purge orifice housed within the upper valve block This regeneration air flows downwards through the saturated desiccant of the other column/s. The expanded dry air flows down through the column/s and regenerates the desiccant. The expanded regeneration air containing the adsorbed moisture is discharged through the exhaust solenoid valve and muffler.

After 4 minutes, 10 seconds, the exhaust solenoid valve closes, the regenerated column/s is/are re-pressurized through the purge air orifice. The pressure in the saturated column/s is vented and the columns switched.

The fully regenerated column/s will now dry the saturated compressed air while the other column/s is/are being regenerate.

Pre-Filter Model FA110IH

Post-Filter Model FA110IG

Qty: 1

Ingersoll Rand
Inspiring Progress™

F-Series Filters

Compressed Air Filtration Solutions

Designed and Built for Exceptional Performance

Ingersoll Rand's advanced F-Series compressed air filters reduce contamination in your air stream to help protect your critical processes and valuable equipment. Our filters are rigorously tested and engineered with superior components to provide years of reliable performance and consistently high-quality air.

Better Quality

Without effective filtration, products and processes that depend on compressed air are subject to increased scrap, poor quality and additional maintenance. Ingersoll Rand F-Series filters address these issues, helping to assure your compressed air system delivers clean, high-quality air throughout your facility.

Better Efficiency

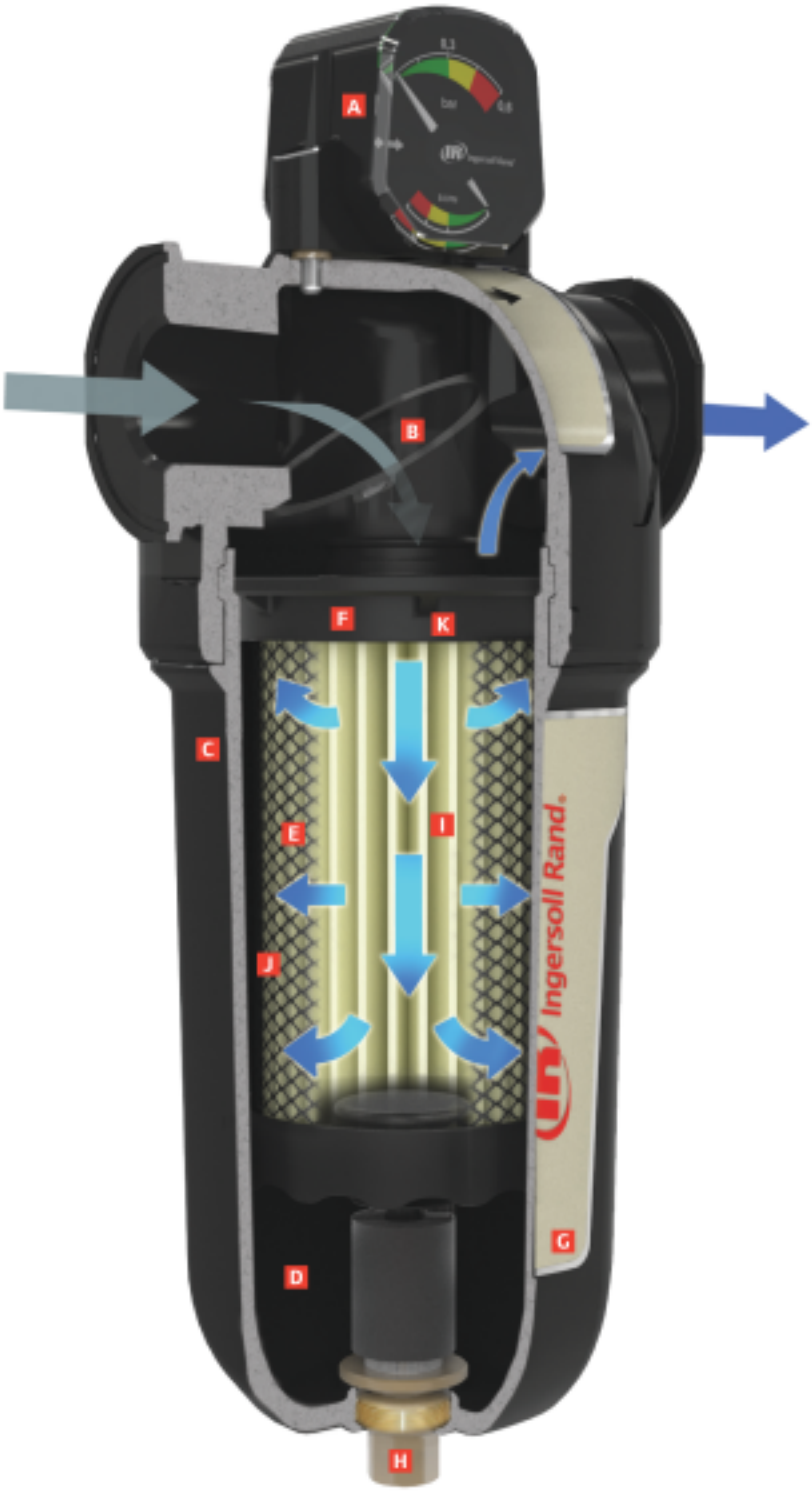
Maintaining a low pressure drop on all compressed air components is critical for an energy-efficient system. Ingersoll Rand F-Series filters have been engineered to deliver low pressure drop throughout the life of the filter element and to provide a unique dual indicator that illustrates the true cost of pressure drop on the system.

Better Choices

Every compressed air system has unique filtration requirements. F-Series filters are available in four different filtration grades, providing complete filtration solutions for all critical compressed air processes.

Superior Filtration Technology

- **A** **Patented dual indicator** shows differential pressure drop and economical operating efficiency
- **B** **Patented smooth bore flow insert** directs air into the filter element, minimizing turbulence and pressure losses
- **C** **All-aluminum, precision die cast body** suitable for 80°C (176 °F) and 17 bar g (250 psig) MAWP applications
- **D** **Proprietary coating** applied to the inside and outside surfaces provides corrosion protection in harsh industrial environments
- **E** **Filter element with stainless steel mesh** withstands high differential pressure while minimizing flow restriction through the element
- **F** **Ergonomic bowl design with no-touch filter element** simplifies element replacement
- **G** **Time strip label** indicates when it's time to change the element (A Grade only)
- **H** **Industrial-grade brass float drain** discharges accumulated condensate and oil more reliably than lesser quality plastic drains (no-loss and manual drains also available)
- **I** **Deep-pleated filter media** reduces air flow velocity to maximize filtration efficiency and minimize pressure losses
- **J** **High-efficiency drainage layer** improves liquid drainage properties and enhances chemical compatibility
- **K** **Simple visual alignment** of the filter head and bowl ensures accurate assembly of components and helps to improve safety



Complete Filtration Solution

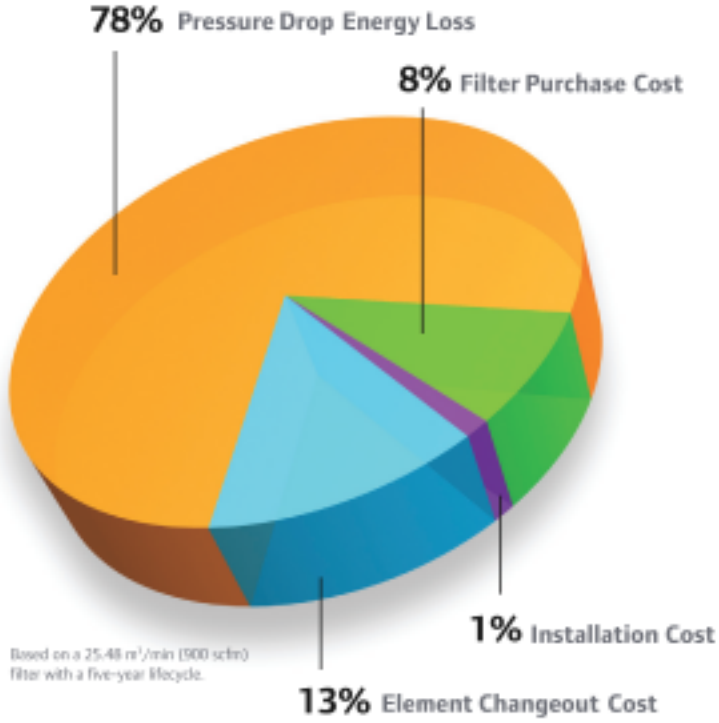
F-Series filters are engineered to be a complete filtration solution, incorporating features that address air quality, energy efficiency and ease of maintenance.

The Standard for High-Quality Air

F-Series filters provide clean, high-quality air as defined by ISO 8573-1:2010, and are certified by a third party under ISO 12500-1:2007. With multiple filter element grades available, there is a filtration solution that will meet your unique requirements.

Energy Efficient Through and Through

Pressure drop accounts for over three-quarters of the ownership cost of a compressed air filter. Even when a filter element is clean and dry, it can rob a compressed air system of pressure, causing the air compressor to work harder and increase energy costs. The flow path through the F-Series filter housing reduces turbulence and enhances efficiency, while the deep-pleated element design further minimizes pressure drop.



Designed with Maintenance in Mind

Features such as no-touch element replacement and visual bowl-to-head alignment indicators make maintaining the F-Series filter hassle-free. The "zero-clearance" design requires minimal space around the filter, allowing F-Series filters to be installed where other filters won't fit. Long element life provides efficient operation for up to one year between element change-outs, helping to reduce overall ownership costs*.

*Frequency of element changeout will depend on the unique conditions of each customer's air system.

Quality Assured by Ingersoll Rand

Ingersoll Rand has more than 20 years of air filtration experience. Our manufacturing facility ensures quality, reliability and outstanding performance. Our filters undergo advanced testing and are uniquely designed and manufactured to work with the full range of Ingersoll Rand products.

F-Series Filter Specifications

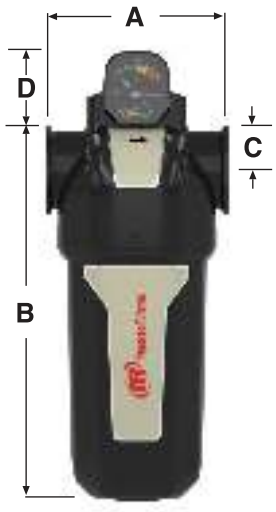
Filter Model Number		Pipe Size	Flow Rates 100 psig/7 bar g		A		B		C		D		Weight	
Model	Grade	in	m^3/min	scfm	mm	in	mm	in	mm	in	mm	in	kg	lb
FA30I	A, G, H, D	3/8″	0.48	17	76	2.99	172	6.77	16	0.63	53	2.09	0.56	1.2
FA40I	A, G, H, D	1/2″	0.62	22	76	2.99	172	6.77	16	0.63	53	2.09	0.55	1.2
FA75I	A, G, H, D	3/4″	1.27	45	98	3.86	227	8.94	22	0.87	53	2.09	1.07	2.4
FA110I	A, G, H, D	3/4″	1.84	65	98	3.86	227	8.94	22	0.87	53	2.09	1.09	2.4
FA150I	A, G, H, D	1″	2.49	88	129	5.08	266	10.47	32	1.26	53	2.09	2.06	4.5
FA190I	A, G, H, D	1″	3.12	110	129	5.08	266	10.47	32	1.26	53	2.09	2.06	4.5
FA230I	A, G, H, D	1″	3.82	135	129	5.08	266	10.47	32	1.26	53	2.09	2.06	4.5
FA400I	A, G, H, D	1 1/2″	6.66	235	129	5.08	356	14.02	32	1.26	53	2.09	2.36	5.2
FA490I	A, G, H, D	1 1/2″	8.21	290	129	5.08	356	14.02	32	1.26	53	2.09	2.36	5.2
FA600I	A, G, H, D	2″	9.91	350	170	6.69	465	18.31	38	1.50	53	2.09	5.20	11.5
FA800I	A, G, H, D	2″	13.31	470	170	6.69	465	18.31	38	1.50	53	2.09	5.24	11.5
FA1000I	A, G, H, D	2″	16.99	590	170	6.69	465	18.31	38	1.50	53	2.09	5.26	11.6
FA1200I	A, G, H, D	3″	20.11	710	205	8.07	547	21.54	55	2.17	53	2.09	9.31	20.5
FA1560I	A, G, H, D	3″	26.05	920	205	8.07	647	25.47	55	2.17	53	2.09	10.69	23.6
FA1830I	A, G, H, D	3″	30.59	1080	205	8.07	647	25.47	55	2.17	53	2.09	10.69	23.6
FA2300I	A, G, H, D	3″	38.23	1350	205	8.07	877	34.53	55	2.17	53	2.09	13.70	30.2
FA2700I	A, G, H, D	3″	45.31	1600	205	8.07	877	34.53	55	2.17	53	2.09	13.70	30.2

Grade A - Activated Carbon Filtration
Oil vapor and hydrocarbon odor removal, providing a maximum remaining oil content of <0.003 mg/m^3 (<0.003 ppm) @ 21°C (60°F). (Precede with Grade H filter)

Grade G - General Purpose Protection
Particle removal down to 1 micron including coalesced liquid, water and oil, providing a maximum remaining oil aerosol content of 0.1 mg/m^3 (0.1 ppm) @ 21°C (60°F).

Grade H - High Efficiency Oil Removal Filtration
Particle removal down to 0.01 micron including water and oil aerosols, providing a maximum remaining oil aerosol content of 0.01 mg/m^3 (0.01 ppm) @ 21°C (60°F). (Precede with Grade G filter)

Grade D - General Purpose Dust Filtration
Dust particle removal down to 1 micron.



Operating Limitations:
Maximum Operating Pressure 17 bar g (250 psig)
Maximum Recommended Operating Temperature (Grade G, H, D) 80°C (176°F)
Maximum Recommended Operating Temperature (Grade A) 30°C (86°F)
Minimum Recommended Operating Temperature 1°C (34°F)

Line Pressure	bar g	1	2	3	5	7	9	11	13	15	16	17
	psig	15	29	44	73	100	131	160	189	218	232	250
Correction Factors		0.38	0.53	0.65	0.85	1.00	1.13	1.25	1.36	1.46	1.51	1.56

To use correction factors, multiply the filter's capacity by the correction factor to get the new filter flow capacity at the non-standard operating pressure. For example, a 110 SCFM filter operating at 160 psig has a correction factor of 1.25. 1.25 x 110 = 137.5 SCFM capacity at 160 psig.

Ingersoll Rand

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Ingersoll Rand (NYSE:IR) advances the quality of life by creating and sustaining safe, comfortable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Schlage®, Thermo King® and Trane® —work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; secure homes and commercial properties; and increase industrial productivity and efficiency. Ingersoll Rand products range from complete compressed air systems, tools and pumps to material handling systems. The diverse and innovative products, services and solutions enhance our customers' energy efficiency, productivity and operations. We are a $14 billion global business committed to a world of sustainable progress and enduring results.

Ingersoll Rand compressors are not designed, intended or approved for breathing air applications. Ingersoll Rand does not approve specialized equipment for breathing air applications and assumes no responsibility or liability for compressors used for breathing air service. F-Series filters are intended for compressed air applications only. Ingersoll Rand assumes no responsibility or liability for filters used in any application other than compressed air.

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Product improvement is a continuing goal at Ingersoll Rand. Designs, available functions and specifications are subject to change without notice or obligation.

DESIGN PARAMETERS:
DESIGN PRESSURE: 20.7 BARG (300 PSIG)
DESIGN TEMPERATURE: 100°C (212°F)

WORKING PARAMETERS
MAXIMUM WORKING PRESSURE: SEE TABLE
MAXIMUM WORKING TEMPERATURE: 80°C (176°F) - G & H GRADES (WITH AUTODRAIN)
100°C (212°F) - G, H, & D GRADES (WITHOUT AUTODRAIN)
30°C (86°F) - A GRADE

FILTRATION GRADES:

GRADE G:
GENERAL PURPOSE PROTECTION
PARTICLE REMOVAL DOWN TO 0.1 MICRON INCLUDING WATER & OIL AEROSOLS
MAXIMUM REMAINING OIL AEROSOL CONTENT:
0.03 mg/m^3 AT 21°C / 0.03 PPM(W) AT 70°F

GRADE H:
HIGH EFFICIENCY OIL REMOVAL FILTRATION
(PRECEDE WITH GRADE G FILTER)
PARTICLE REMOVAL DOWN TO 0.01 MICRON INCLUDING WATER & OIL AEROSOLS
MAXIMUM REMAINING OIL AEROSOL CONTENT:
0.01 mg/m^3 AT 21°C / 0.008 PPM(W) AT 70°F

GRADE A:
OIL VAPOUR AND ODOUR REMOVAL
(PRECEDE WITH GRADES G & H FILTERS)
MAXIMUM REMAINING OIL VAPOUR CONTENT:
0.003 mg/m^3 AT 21°C / 0.003 PPM(W) AT 70°F

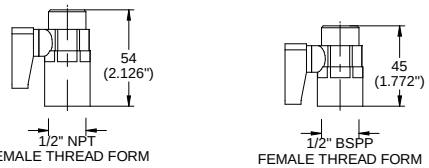
GRADE D:
GENERAL PURPOSE DUST PROTECTION
DRY PARTICLE REMOVAL DOWN TO 1 MICRON

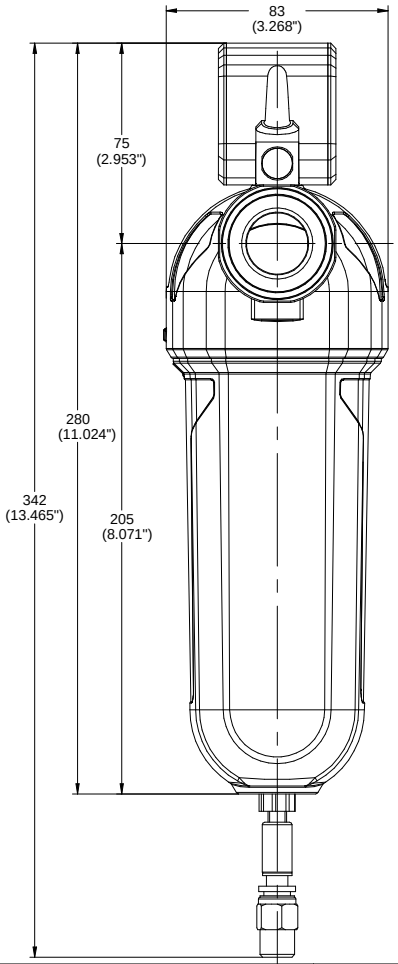
"FILTER ASSEMBLIES TO HAVE CANADIAN REGISTRATION NUMBER – (CRN)"

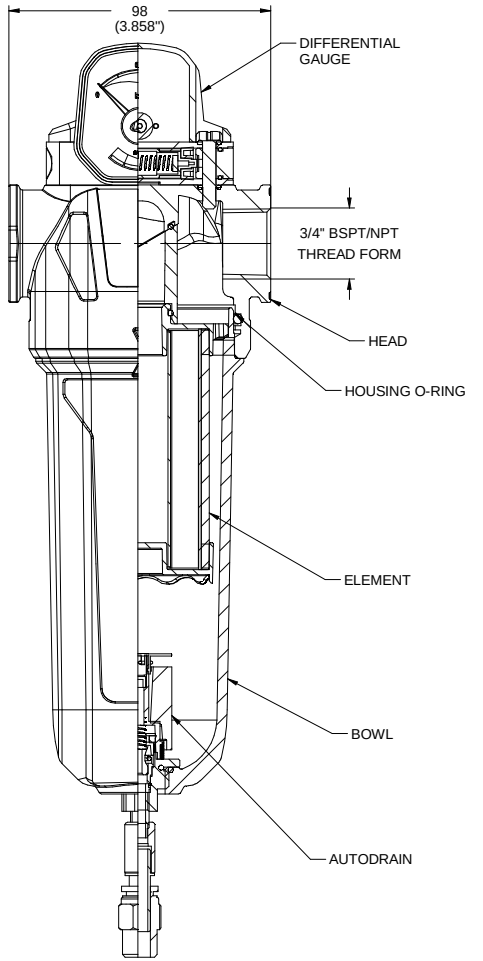
REVISIONS

ZONE	REV	ECN	DESCRIPTION	DATE	DRAWN	APP'D
	A	81393	ORIGINAL REREASE	04.01.2013	B.PFAJFAR	J.JAKOP
	B	81650	REVISED TITLE BLOCK NOMENCLATURE FROM FC TO FA; REVISED TABLE MODEL F TO FA	26.03.2013	B.PFAJFAR	J.JAKOP
	C	82811	REVISED FILTRATION GRADES (grade G) Oil content 0.6 mg/m3 / 0.5 PPM(W) TO 0.03 mg/m3 / 0.03 PPM(W); ADD MANUAL DRAIN OPTION NPT THREAD FORM; REVISED TABLE FILTER NPT WITH MANUAL DRAIN BSP (CCN 24335036) TO NPT (CCN 24623803)	12.11.2013	B.PFAJFAR	J.JAKOP
	D	82811	REVISED FILTER DIMESION: 281mm to 280mm, 206mm to 205mm	13.05.2014	B.PFAJFAR	J.JAKOP
	E	82813	REVISED FILTRATION GRADES (grade G) 1 micron to 0,1 micron REVISED FILTRATION GRADES (grade H) 0,01 PPM(W) to 0,008 PPM(W)	07.07.2014	B.PFAJFAR	J.JAKOP
	F	82947	Add note about Canadian registration number (CRN)	02.12.2014	B.PFAJFAR	J.JAKOP
	G	83323	Add inch dimensions on drawings	23.3.2015	B.PFAJFAR	J.JAKOP

MANUAL DRAIN OPTION







MODEL	FILTER CCN	PORT SIZE	ELEMENT CCN	MAX. WORKING PRESSURE	FLOW scfm	FLOW l/s	FLOW m3/h	DRAIN	DRAIN CCN	HOUSING O-RING CCN	DIFFERENTIAL GAUGE
FA75IG	24231953	3/4" BSPT	24241895	17,25 barG (250 psiG)	45	21	76	AUTODRAIN	24335028	24334955	24335044
FA75IH	24231987	3/4" BSPT	24241903	17,25 barG (250 psiG)	45	21	76	AUTODRAIN	24335028	24334955	24335044
FA75IA	24231912	3/4" BSPT	24241861	17,25 barG (250 psiG)	45	21	76	MANUAL	24335036	24334955	N/A
FA75ID	24231938	3/4" BSPT	24241879	17,25 barG (250 psiG)	45	21	76	MANUAL	24335036	24334955	24335044
FA75IG	24233363	3/4" NPT	24241895	17,25 barG (250 psiG)	45	21	76	AUTODRAIN	24335028	24334955	24335051
FA75IH	24233389	3/4" NPT	24241903	17,25 barG (250 psiG)	45	21	76	AUTODRAIN	24335028	24334955	24335051
FA75IA	24233322	3/4" NPT	24241861	17,25 barG (250 psiG)	45	21	76	MANUAL	24623803	24334955	N/A
FA75ID	24233348	3/4" NPT	24241879	17,25 barG (250 psiG)	45	21	76	MANUAL	24623803	24334955	24335051
FA110IG	24233124	3/4" BSPT	24241952	17,25 barG (250 psiG)	65	31	110	AUTODRAIN	24335028	24334955	24335044
FA110IH	24232050	3/4" BSPT	24241960	17,25 barG (250 psiG)	65	31	110	AUTODRAIN	24335028	24334955	24335044
FA110IA	24232001	3/4" BSPT	24241929	17,25 barG (250 psiG)	65	31	110	MANUAL	24335036	24334955	N/A
FA110ID	24232027	3/4" BSPT	24241937	17,25 barG (250 psiG)	65	31	110	MANUAL	24335036	24334955	24335044
FA110IG	24233447	3/4" NPT	24241952	17,25 barG (250 psiG)	65	31	110	AUTODRAIN	24335028	24334955	24335051
FA110IH	24233462	3/4" NPT	24241960	17,25 barG (250 psiG)	65	31	110	AUTODRAIN	24335028	24334955	24335051
FA110IA	24233405	3/4" NPT	24241929	17,25 barG (250 psiG)	65	31	110	MANUAL	24623803	24334955	N/A
FA110ID	24233421	3/4" NPT	24241937	17,25 barG (250 psiG)	65	31	110	MANUAL	24623803	24334955	24335051

PLURIFILTER		SEE TABLE
MFR NAME	ADDRESS	PART NO.

- ONLY THE ITEM DESCRIBED ON THIS DRAWING WHEN PROCURED FROM THE MANUFACTURER(S) LISTED HEREON IS APPROVED.
A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT WRITTEN APPROVAL BY THE INGERSOLL-RAND COMPANY.
- THIS PART SHALL BE LABELED WITH THE I-R NAME AND PART NUMBER. NO SUPPLIER INFORMATION OR SUPPLIER LABELING SHOULD APPEAR ON THE PART OR PART PACKAGING. IF THE PART SIZE AND/OR SHAPE PREVENT PRIVATE LABELING, THE PART SHOULD HAVE NO IDENTIFICATION OF ANY TYPE ON THE PART.

APPROVED SOURCES OF SUPPLY

STANDARD TOLERANCES

ALL DIMENSIONS ARE IN MILLIMETERS [INCHES (IF SHOWN)]

UNSPECIFIED TOLERANCES:

WHOLE : ±1
ONE PLACE (.X) : ±0.5
TWO PLACE (.XX) : ±0,25
ANGLES (.X) : ±1°

Ingersoll-Rand Industrial Technologies

DO NOT SCALE DRAWING

DRAWING CONFORMS TO ASME Y14.5M - 1994

CAD GENERATED DRAWING, NO MANUAL REVISIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:
- REMOVE ALL BURRS AND SHARP CORNERS
- WELD SYMBOLS TO BE IN ACCORDANCE WITH ANSI//AWS A2.4

THIRD ANGLE PROJECTION

DRAWN	PFAJFAR	DATE 01.12. 2012
CHECKED	JAKOP	DATE 04.01. 2012
APPROVED	JAKOP	DATE 04.01. 2012

Ingersoll Rand

TITLE: FILTER INDEX, DRYER FILTER FA75I, FA110I (W/DRAIN)

SIZE	ESTIMATED WEIGHT (KG UNLESS OTHERWISE SPECIFIED)	DRW NO.	REV
A1	0.0	24333072	G

SCALE 0.50 UNIT - SHEET 1 OF 1

Air Filtration

High Efficiency Series

Compressed Air Systems and Services
Davidson, NC 28036

Date: 1-July-2014
Cancels: All Previous

PERFORMANCE

MODEL	INLET AIR FLOW (SCFM)	INLET AIR FLOW (M^3/MIN)
FA30IH	17	0.48
FA40IH	22	0.62
FA75IH	45	1.27
FA110IH	65	1.84
FA150IH	88	2.49
FA190IH	110	3.12
FA230IH	135	3.82
FA400IH	235	6.66
FA490IH	290	8.21
FA600IH	350	9.91
FA800IH	470	13.31
FA1000IH	590	16.99
FA1200IH	710	20.11
FA1560IH	920	26.05
FA1830IH	1080	30.59
FA2300IH	1350	38.23
FA2700IH	1600	45.31
F3000IH	1800	50.00
F4000IH	2400	67.00
F5000IH	3000	83.00
F6100IH	3600	102.00
F7100IH	4200	118.00
F8100IH	4800	135.00
F10100IH	6000	168.00
F15200IH	9000	253.00
F22400IH	13200	373.00

Correction Factors:

Operating Pressure (barg)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Operating Pressure (psig)	15	29	44	58	73	87	102	116	131	145	160	174	189	203	218	232	247
Correction Factor	0.38	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20	1.25	1.31	1.36	1.41	1.46	1.51	1.56

	17 - 1600 SCFM	1800 - 13200 SCFM
Maximum Operating Pressure:	250 psig / 17.2 barg	150 psig / 10.35 barg
Maximum Operating Temperature:	212°F / 100°C	212°F / 100°C
Minimum Operating Temperature:	34°F / 1°C	34°F / 1°C

Data refers to the following standard conditions:
Ambient Temperature 70°F (21°C), Inlet Temperature 95°F (35°C), Inlet Pressure 100 psig (7 barg)
Maximum Operating Temperature 176°F / 80°C with auto drain

Air Filtration

General Purpose Series

Compressed Air Systems and Services
Davidson, NC 28036

Date: 1-July-2014
Cancels: All Previous

PERFORMANCE

MODEL	INLET AIR FLOW (SCFM)	INLET AIR FLOW (M^3/MIN)
FA30IG	17	0.48
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FA230IG	135	3.82
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FA600IG	350	9.91
FA800IG	470	13.31
FA1000IG	590	16.99
FA1200IG	710	20.11
FA1560IG	920	26.05
FA1830IG	1080	30.59
FA2300IG	1350	38.23
FA2700IG	1600	45.31
F3000IG	1800	50.00
F4000IG	2400	67.00
F5000IG	3000	83.00
F6100IG	3600	102.00
F7100IG	4200	118.00
F8100IG	4800	135.00
F10100IG	6000	168.00
F15200IG	9000	253.00
F22400IG	13200	373.00

Correction Factors:

Operating Pressure (barg)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Operating Pressure (psig)	15	29	44	58	73	87	102	116	131	145	160	174	189	203	218	232	247
Correction Factor	0.38	0.53	0.65	0.76	0.85	0.93	1.00	1.07	1.13	1.20	1.25	1.31	1.36	1.41	1.46	1.51	1.56

	17 - 1600 SCFM	1800 - 13200 SCFM
Maximum Operating Pressure:	250 psig / 17.2 barg	150 psig / 10.35 barg
Maximum Operating Temperature:	212°F / 100°C	212°F / 100°C
Minimum Operating Temperature:	34°F / 1°C	34°F / 1°C

Data refers to the following standard conditions:
Ambient Temperature 70°F (21°C), Inlet Temperature 95°F (35°C), Inlet Pressure 100 psig (7 barg)
Maximum Operating Temperature 176°F / 80°C with auto drain

Air Filtration

High Efficiency Series

Compressed Air Systems and Services
Davidson, NC 28036

Date: 1-July-2014
Cancels: All Previous

MATERIALS OF CONSTRUCTION

COMPONENT	THREADED CONNECTION (MODELS FA30IH TO FA2700IH)	FLANGE CONNECTION (MODELS F3000IH TO F22400IH)
Filter Head	Precision Die Cast Aluminum	Pressure Vessel Quality Steel
Filter Body	Precision Die Cast Aluminum	Pressure Vessel Quality Steel
Surface Finish	Painted	Painted
O-Rings	High Nitrile Rubber	High Nitrile Rubber
Gaskets	N/A	Novus-Supra (Non-Asbestos Fiber)
Element: Filter Media End Caps Support Core	 Borosilicate Microfiber Glass Filled Nylon Expended Stainless Steel	 Borosilicate Microfiber Aluminum Perforated Stainless Steel
Drain	Automatic	Not included

Air Filtration

General Purpose Series

Compressed Air Systems and Services
Davidson, NC 28036

Date: 1-July-2014
Cancels: All Previous

MATERIALS OF CONSTRUCTION

COMPONENT	THREADED CONNECTION (MODELS FA30IG TO FA2700IG)	FLANGE CONNECTION (MODELS F3000IG TO F22400IG)
Filter Head	Precision Die Cast Aluminum	Pressure Vessel Quality Steel
Filter Body	Precision Die Cast Aluminum	Pressure Vessel Quality Steel
Surface Finish	Painted	Painted
O-Rings	High Nitrile Rubber	High Nitrile Rubber
Gaskets	N/A	Novus-Supra (Non-Asbestos Fiber)
Element: Filter Media End Caps Support Core	 Borosilicate Microfiber Glass Filled Nylon Expended Stainless Steel	 Borosilicate Microfiber Aluminum Perforated Stainless Steel
Drain	Automatic	Not included

Ingersoll Rand
Air Filtration

Industrial Technologies
Davidson, NC 28036

Ref:
Date: 15 August 2008
Cancels: FIRST EDITION

General Description

H Filter Series

The high efficiency filter is designed to remove liquids and solids from compressed air. The filter removes particles down to 0.01 micron-liquids down to 0.01 mg/m3 W at 21°C (0.01 ppm W at 70°F). The initial dry pressure drop at rated inlet air pressure and rated flow will not exceed 1 psig, where as the initial wet pressure drop will not exceed 3 psig.

These filters should be preceded by a G pre-filter. The H series is especially suited for applications such as protecting instrumentation systems and gauging equipment, air bearings, advanced pneumatic and in sophisticated process and electronic plants.

The filter utilizes the coalescing method for removing contaminants. The filter elements are easy to replace with a no-touch process. They are constructed of multi-layered borosilicate microfiber media; glass filled nylon end caps, and perforated stainless steel inner and outer support cores.

The housing is constructed of either pressure die-cast aluminum, extruded aluminum or pressure vessel quality steel. The filter has an automatic drainage system for constant removal of contaminants.

The no-touch process makes element replacement a quick & easy task. The durable stainless steel element inner and outer core will withstand sudden pressure surges up to 100 psig. The element top end cap has an over molded seal and patented tapered location that ensures a perfect seal.

Ingersoll Rand
Air Filtration

Industrial Technologies
Davidson, NC 28036

Ref:
Date: 15 August 2008
Cancels: FIRST EDITION

General Description

G Filter Series

The general purpose pre-filter is designed to remove solid and liquid contaminates from compressed air. The filter will remove oil, water, dust, metal particles and pipescale. Solids will be removed down to 1 micron, liquids down to 0.5 mg/m^3 W at 21°C (0.5 ppm W at 70°F). The initial dry pressure drop at rated inlet air pressure and rated flow will not exceed 1.5 psig, where as the initial wet pressure drop will not exceed 2 psig.

The G filter utilizes the interception method for removing contaminates. The element is constructed of multi-layer borosilicate microfiber media, glass filled nylon end caps, and a perforated stainless steel inner and outer support core.

The housing is constructed of either pressure die-cast aluminum, extruded aluminum or pressure vessel quality steel. The filter has an automatic float drain for constant removal of contaminates.

The no-touch process makes element replacement a quick & easy task. The durable stainless steel element inner and outer core will withstand sudden pressure surges up to 100 psig. The element top end cap has an over molded seal and patented tapered location that ensures a perfect seal.