WATER BYPASS PANEL
OPERATING MANUAL

REVISION HISTORY

LEVEL	DATE	REVISION DESCRIPTION	SIGNATURES
1	31 March 2010	Draft	

Table of Contents

REVISION HISTORY 2

FOR YOUR SAFETY 4

INSTALLATION..... 5

OPERATION..... 6

MAINTENANCE..... 6

COMPONENT INFORMATION..... 7

DRAWINGS.....10

FOR YOUR SAFETY

1. Signs and Symbols:

Throughout the operating manual, the information and notices below are identified by graphical symbols.

DANGER!
Safety note indicating imminent danger. Failure to heed the warning may result in serious bodily injury and even death.

CAUTION!
Safety note indicating the presence of potential hazard. Failure to heed the safety notice may result in minor bodily injury or damage to the equipment.

INFORMATION!
This symbol identifies important information or a useful tip concerning the application or service of the unit.

2. Safety Notes:

For the installation and operation of the water bypass panel, the following regulations and safety notes have to be observed**.**

Any work on the Water bypass panel may only be performed by qualified personnel. All relevant accident prevention regulations have to be observed.

Any national regulations applicable in the country of installation must be observed.

INSTALLATION

1. The Water Bypass Panel consists of valving to switch cooling fluid source from the Heat Exchanger Cabinet (HEC) to an Alternate Cooling Fluid Supply. The Alternate Cooling Fluid Supply is typically city water but may also be derived from the building central chilled water supply.[1]

2. The Water Bypass Panel is designed to be installed in the equipment room indoors only. The Water Bypass Panel must be installed in the piping connecting the HEC to the Cryogenic Compressor. An assortment of hose and fittings are included to complete the fluid connections needed for typical installations (Figure 1).

Figure 1

3. Fluid supply pressure gage, temperature gage and a flow rate meter are included in the panel. See the Cryogenic Compressor Owner's Manual for fluid temperature and flow requirements to determine a proper fluid source and return (return/drain).

Caution: Make sure all piping is clean before installation.

[1] If the source is potable water then a backflow preventer must be installed on the Alternate Fluid Supply line.

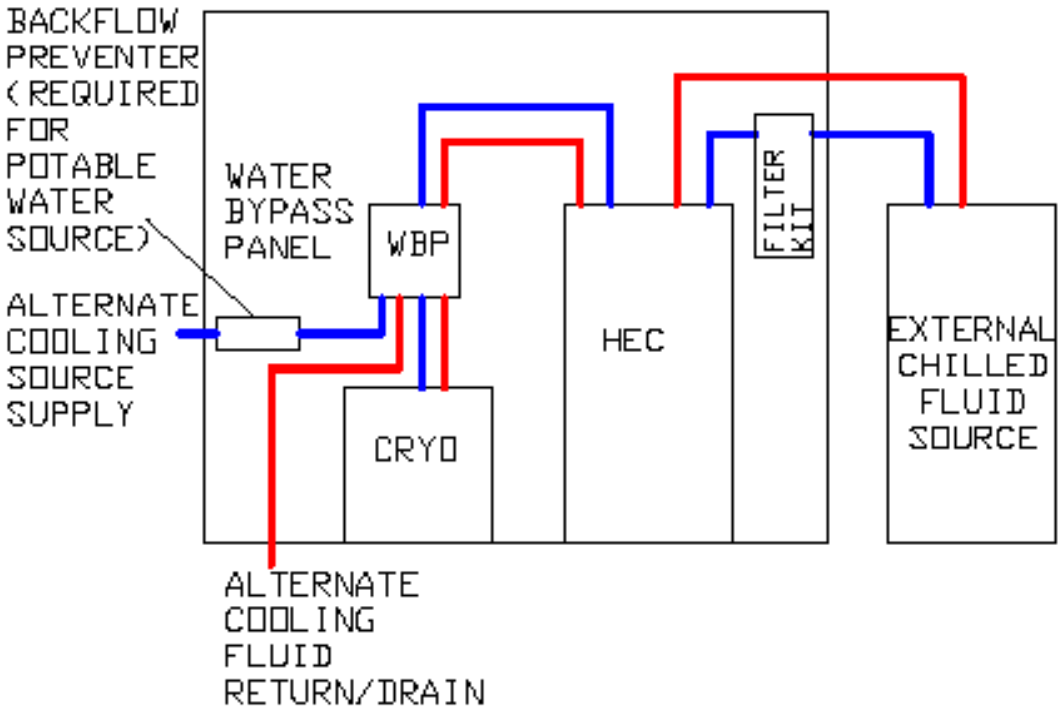


Figure 2

OPERATION

1. To switch to Alternate Cooling Water Supply the panel door must be opened.
2. Manually operate the valve set according to the valve position label. The valve must be quickly operated to the full stroke valve position to prevent mixing of the Alternate Cooling Fluid Source into the dedicated cooling fluid that comes from the HEC.
3. Observe the fluid flow on the meter provided. If the alternate fluid is city water, monitor the drain to make sure that drain capacity exceeds the Alternate Cooling Fluid Source flow rate.
4. When the dedicated cooling fluid source is re-established switch the valves quickly back to the HEC supply position. Check the glycol concentration of the external chilled fluid source (Heat Exchanger)[2].

MAINTENANCE

Clean the fluid strainer one hour after initial use then annually or as required.

For flow rates up to 2 gallon/minute the Water Bypass Panel will have a pressure drop of 3 psid clean, the strainer should be cleaned when the pressure drop exceeds 5 psid.

[2] The glycol concentration should be maintained according to the Heat Exchanger Owner's Manual.

COMPONENT INFORMATION

70-900 SERIES

Standard Port 3-Way Diversion
Solder End Bronze Ball Valve

Job Name:	**Contractor:**
Job Location:	**P.O. Number:**
Engineer:	**Representative:**
Tag:	**Wholesale Distributor:**

DESCRIPTION

The Apollo® 70-900 Series is designed to be soft soldered without disassembly and is ideal for flow diversion; its larger ports make tank selection and fluid transfers simpler.

FEATURES

- Adjustable Packing Gland
- Blow-Out Proof Stem Design
- RPTFE Seats and Stuffing Box Ring
- 100% Factory Tested

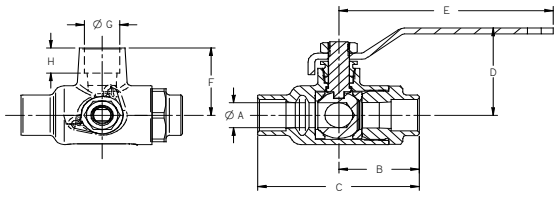
PERFORMANCE RATING

- Maximum Pressure: 400 psi CWP
- Maximum Temperature: 500°F

STANDARD MATERIALS LIST

Lever and Grip	Steel, Zinc Plated w/ Vinyl
Stem Packing	RPTFE
Stem Bearing	RPTFE
Ball	B16 Brass, Chrome Plated
Seat (2)	RPTFE
Retainer	B16 Brass
Gland Nut	B16 Brass
Stem	B16 Brass
Lever Nut	Steel, Zinc Plated
Body	B584 Bronze -C84400

DIMENSIONS

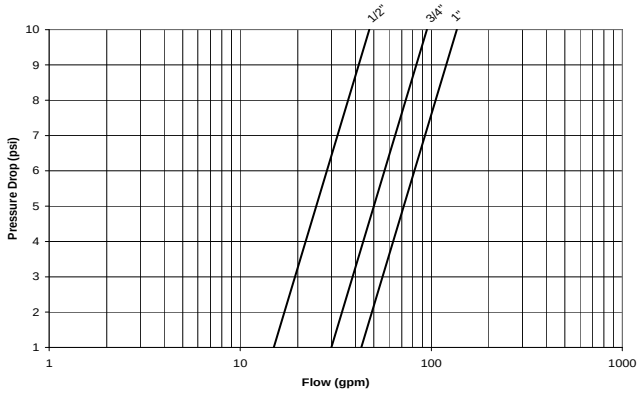


Model Number	Size (in.)	Dimensions								Wt (lbs.)
		A	B	C	D	E	F	G	H	
70-903	1/2"	0.50	1.44	2.87	1.75	3.87	1.34	0.63	0.50	0.76
70-904	3/4"	0.68	1.94	3.87	2.12	4.87	1.69	0.88	0.90	1.65
70-905	1"	0.87	2.19	4.42	2.25	4.87	1.87	1.13	0.90	2.15

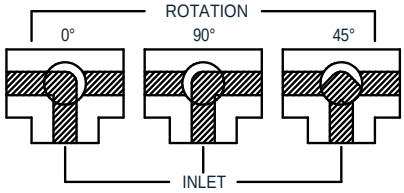
APPROVALS

- MSS SP-110; Ball Valves, Threaded, Socket-Welding,
- Federal Specifications: WW-V-35C, Type: II,
- Canadian Registration Number: 0C10908.5C

FLOW CAPACITY



FLOW PATTERN VIEW FROM TOP



OPTIONS & SIZES

☐ 02 -Stem Grounded	½" to 1"
☐ 03 -1 ¼" CS Stem Extension	½" to 1"
☐ 04 -2 ¼" CS Stem Extension	½" to 1"
☐ 05 -Plain Ball	½" to 1"
☐ 10 -SS Lever & Nut	½" to 1"
☐ 17 -Rough Chrome Plated-Bronze Valves	½" to 1"
☐ 21 -UHMWPE Seats (Non-PTFE)	½" to 1"
☐ 29 -Graphite Packing	½" to 1"
☐ 27 -SS Latch-Lock Lever & Nut	½" to 1"
☐ 35 -VTFE Trim	½" to 1"
☐ 50 -2 ¼" CS Locking Stem Extension	½" to 1"
☐ 56 -MPTFE Seats & Packing	½" to 1"
☐ 57 -Oxygen Cleaned	½" to 1"
☐ 60 -Static Grounded Ball & Stem	½" to 1"

Conbraco Industries, Inc. 701 Matthews Mint Hill Rd. Matthews NC 28106 USA; www.apollovalves.com ; 704-841-6000

This specification is provided for reference only. Conbraco reserves the right to change any portion of this specification without notice and without incurring obligation to make such changes to Conbraco products previously or subsequently sold.

VARIABLE AREA FLOWMETERS

THE 400 SERIES OF IN-LINE UNITS

F-400N

The F-400N Series

F-400N FEATURES Include

- Tough machined acrylic meter body, highly polished to a clear finish.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade Viton® o-ring seals.
- Standard models #316 stainless steel float guide rods. (Optional K-series hastelloy C-276).
- Standard models #316 stainless steel, PVDF, Teflon float. (Optional K-series hastelloy C-276, PVDF, Teflon).
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.

F-400N SPECIFICATIONS

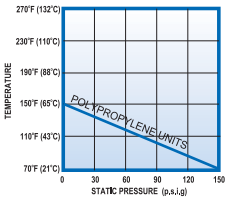
Max. Working Pressure..... 150 psig (10.3 bar) @ 70˚ F (21˚ C)
Max. Fluid Temperature..... Polypropylene adapters: 150˚ F (65˚ C) @ 0 PSI
Full scale accuracy..... +/- 5%
Meter body material..... Machined acrylic
O-ring seals..... Viton® (optional EP)
Approximate shipping wt...... 1/2 lb. (.23 kg)
NIST certificates optional

PIPE SIZES:
1/4", 3/8" and 1/2" F/NPT

FLOW RATES:
0.025 to 5 GPM
0.1 to 20 LPM
.2 to 20 SCFM
.4 to 34 M³HR

DIMENSIONS:
Height: 8 3/16"
Width: 1 1/4"

F-400N TEMPERATURE vs. PRESSURE



F-420N

The F-420N Series

F-420N FEATURES Include

- Tough machined acrylic meter body, highly polished to a clear finish.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade Viton® o-ring seals.
- Standard models #316 stainless steel float guide rods. (Optional K-series hastelloy C-276).
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.

F-420N SPECIFICATIONS

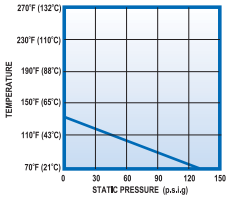
Max. Working Pressure..... 130 psig (8.9 bar) @ 70˚ F (21˚ C)
Max. Fluid Temperature..... 130˚ F (54˚ C) @ 0 PSI
Full scale accuracy..... +/- 5%
Meter body material..... Machined acrylic
O-ring seals..... Viton® (optional EP)
Approximate shipping wt...... 2 lb. (.91 kg)
NIST certificates optional

PIPE SIZES:
1" and 1 1/2" M/NPT

FLOW RATES:
5 to 50 USGPM
20 to 200 LPM

DIMENSIONS:
Height: 12"
Width: 2"

F-420N TEMPERATURE vs. PRESSURE



The F-410N Series

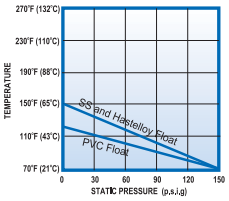
F-410N FEATURES Include

- Tough machined acrylic meter body, highly polished to a clear finish.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade Viton® o-ring seals.
- Standard models #316 stainless steel float guide rods. (Optional K-series hastelloy C-276).
- Standard models #316 stainless steel or PVC float. (Optional K-series hastelloy C-276 or PVC).
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.

F-410N SPECIFICATIONS

Max. Working Pressure..... 150 psig (10.3 bar) @ 70˚ F (21˚ C)
Max. Fluid Temperature..... 316 SS and Hastelloy Floats: 150˚ F (65˚ C) @ 0 PSI
PVC floats: 120˚ F (49˚ C) @ 0 PSI
Full scale accuracy..... +/- 5%
Meter body material..... Machined acrylic
O-ring seals..... Viton® (optional EP)
Approximate shipping wt...... 2 lb. (.91 kg)
NIST certificates optional

F-410N TEMPERATURE vs. PRESSURE



PIPE SIZES:
3/4" and 1" F/NPT

FLOW RATES:
1 to 20 USGPM
4 to 80 LPM
4 to 80 SCFM
8 to 135 M³HR

DIMENSIONS:
Height: 11"
Width: 1 3/4"

F-410N

F-430N

The F-430N Series

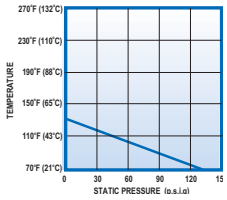
F-430N FEATURES Include

- Tough machined acrylic meter body, highly polished to a clear finish.
- Direct reading permanent scale.
- White back reflector for easy reading.
- Sturdy adapters with high grade Viton® o-ring seals.
- Standard models #316 stainless steel float guide rods. (Optional K-series hastelloy C-276).
- Acceptable in direct sunlight applications.
- Available OEM options: Private labeling, custom calibrations, custom materials.
- Optional Polypropylene and CPVC Adapters available.

F-430N SPECIFICATIONS

Max. Working Pressure..... 130 psig (8.9 bar) @ 70˚ F (21˚ C)
Max. Fluid Temperature..... 130˚ F (54˚ C) @ 0 PSI
Full scale accuracy..... +/- 5%
Meter body material..... Machined acrylic
O-ring seals..... Viton® (optional EP)
Approximate shipping wt...... 6 lb. (2.7 kg)
NIST certificates optional

F-430N TEMPERATURE vs. PRESSURE



PIPE SIZES:
1 1/2" M/NPT and 2" F/NPT

FLOW RATES:
4 to 100 USGPM
15 to 375 LPM

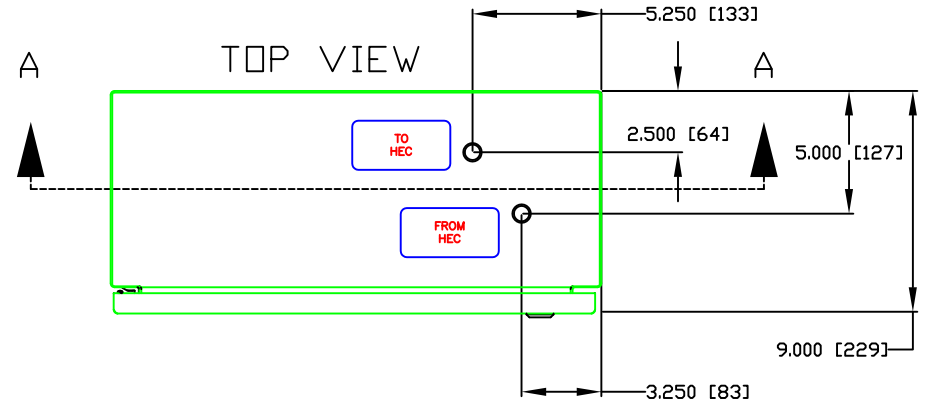
DIMENSIONS:
Height: 14"
Width: 3"

* Viton® is a registered trademark of DuPont.

HEC = MAIN (NORMAL) COOLING SOURCE
ALTERNATE SUPPLY = BACKUP COOLING SOURCE
CRYO = EQUIPMENT TO BE COOLED

SECTION A-A

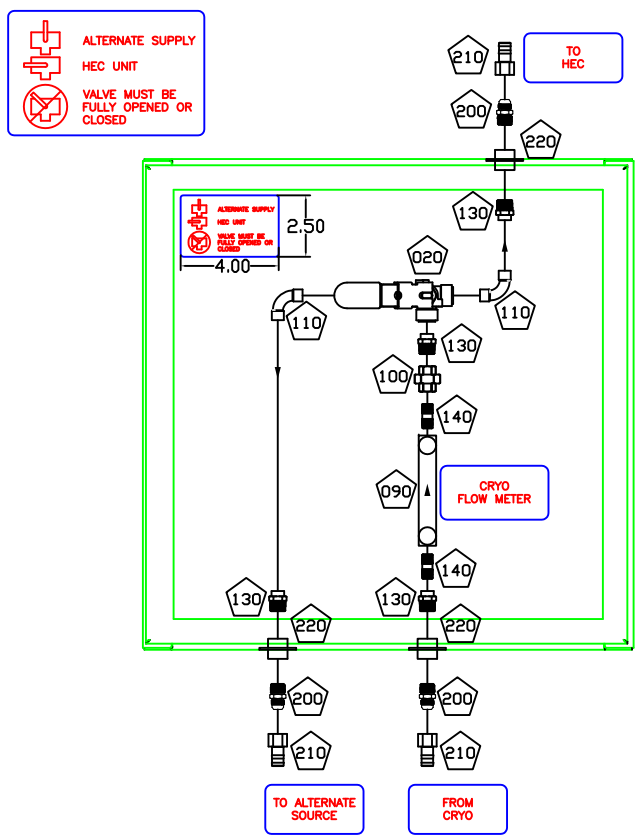
THIS PIPING IS LOCATED BEHIND THE PIPING SHOWN IN "FRONT VIEW"

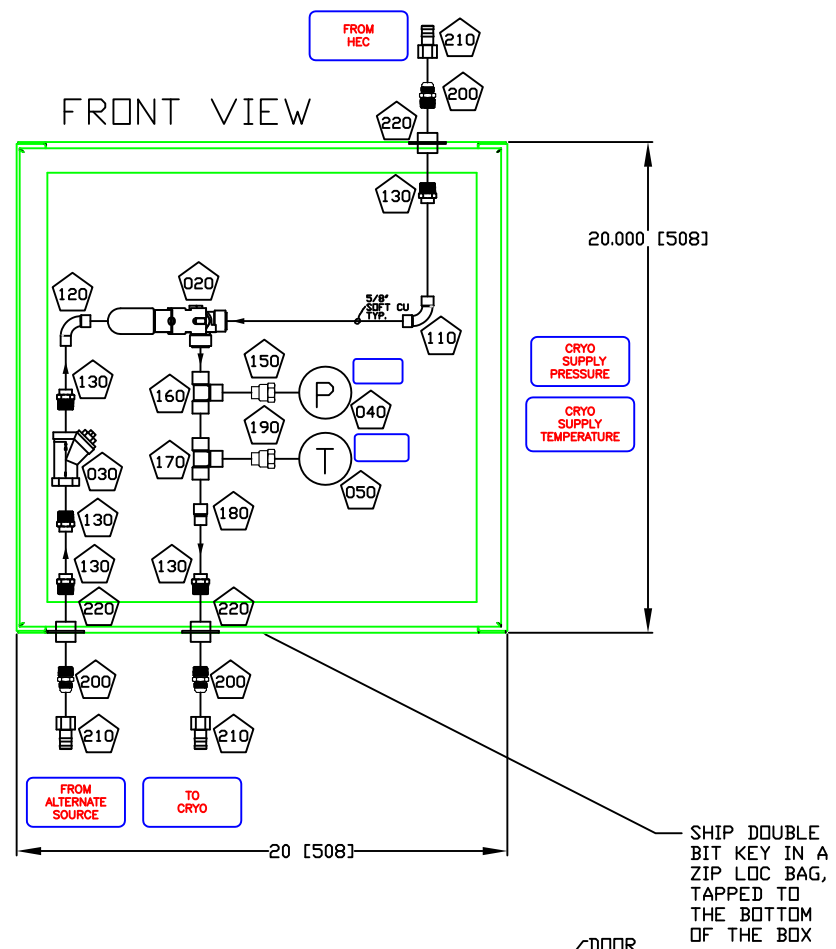


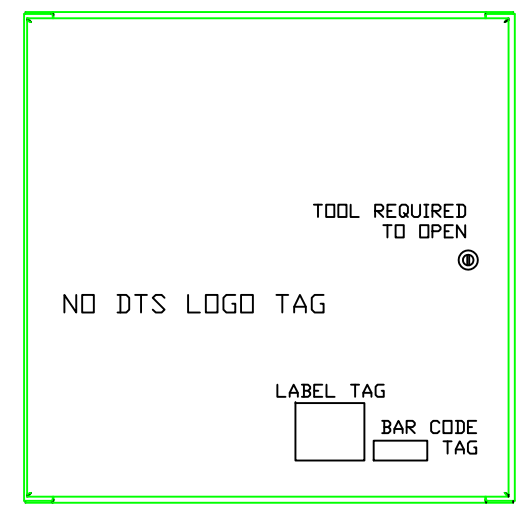
NOTE:
INSULATE TO ES-001 STANDARDS FOR LOW TEMP APPLICATION, PER 40 DEG F SETPOINT FOR NON (-L) UNITS.

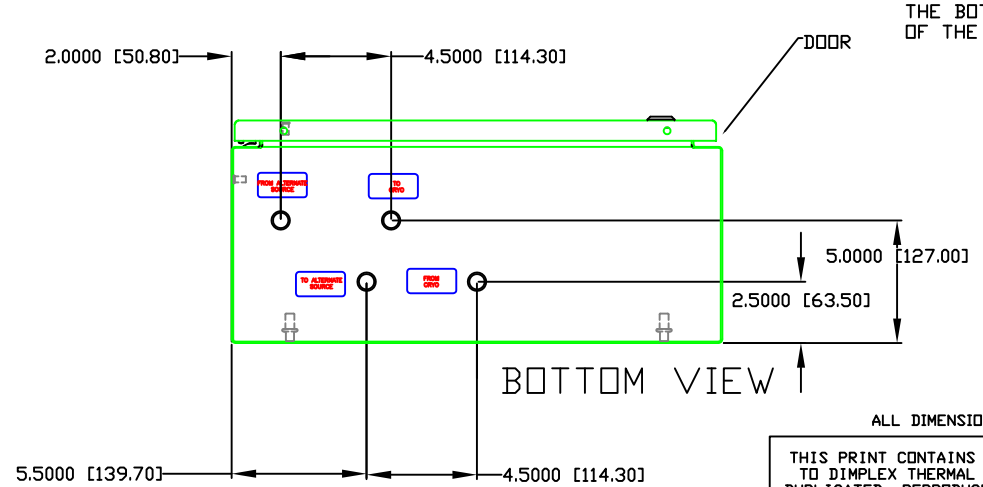
SOLDER WITH SOFT SOLDER JW HARRIS "BRIDGIT" TYPE

1) PAINT INSIDE OF BOX BEFORE ADDING PLUMBING.
2) SAVE PLASTIC BAG THE BOX COMES IN FOR OUTBOUND SHIPPING
3) WELD FULL COUPLINGS TO COUPLING WASHER AND MOUNT TO INSIDE OF BOX.
4) SHIP DOUBLE BIT KEY IN A ZIP LOCK BAG, TAPED TO THE BOTTOM OF THE BOX
5) MOUNTING FEET ARE SHIPPED LOOSE









060 070 VALVE HANDLES WILL BE CONNECTED BY A MECHANICAL LINKAGE

080 COVER THREADED ROD WITH HEAT SHRINK TUBING.

ALL DIMENSIONS ARE IN INCHES

THIS PRINT CONTAINS INFORMATION PROPRIETARY TO DIMPLEX THERMAL SOLUTIONS. MAY NOT BE DUPLICATED, REPRODUCED, OR SHARED IN ANY WAY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DIMPLEX THERMAL SOLUTIONSS.

CONFIDENTIAL AND PROPRIETARY

DATE	DESCRIPTION OF REVISION	APPROVED BY
08/02/10	ADDED UNIONS FOR SERVICEABILITY	RMS (B)
07/19/10	REMOVED SHIP LOOSE ITEMS	MAR (A)

PIPING PARTS

	NO.	ID/DESCRIPTION	K. K. PART#	QTY	TYPE
	001	SWITCHOVER PANEL 1/2 PLUMBING GE	0445629		ASSEM
	010	BOX NEMA 4/12 20 X 20 X 8 SAGINAW CONTROLS	3444008	1.0	PC
	020	1/2" SOLDER 3-WAY VALVE 70-903-01 APOLLO	4113066	2.0	PC
	030	1/2NPT, 100 MESH STRAINER BRONZE WITH A #100 WIRE MESH LINER, 140 MICRONS, McMASTER CARR	4353009	1.0	PC
	040	GAUGE PIPING CBM 0-160 PSI/BAR W/U-CLAMP AND SCREWS 25400FG02U160	4246016	1.0	PC
	050	B309939-2 THERMOMETER 3" DIAL 2-1/2 STEM LENGTH, 1/2 MPT -40-160°F, -40-70°C MILJOCO (OLD # B309839-2)	4220103	1.0	PC
	060	6058K32 BALL JOINT LINKAGE1/4"-28 QUICK DISCONNECT LINKAGE, MCMASTER CARR	7799979	2.0	PC
	070	98915A029 ROD 1/4-28 THREADED (6' SECTIONS)	7712007	4.5	PC
	080	HSTT38-480 HEAT SHRINK 3/8" BLACK SOLD IN 48" LONG PIECE, PANDUIT	3802530	1.0	PC
	090	F-40376LN-8 FLOW METER 0.2-2.0 GPM BLUE WHITE	4290035	1.0	PC
	100	UNION 1/2 FPT BRS	7504400	1.0	PC
	110	W-2722 ELBOW 90 5/8 C X C LR	7305281	4.0	PC
	120	W-2822 ELBOW 90 5/8 FTG X C LR	7305321	1.0	PC
	130	WB-1131 ADAPTER 5/8 C X 1/2 MPT	7305101	9.0	PC
	140	NIPPLE 1/2 MPT X 2 BRS	7504020	2.0	PC
	150	BUSHING 3/8 MPT X 1/4 FPT BRS	7503600	1.0	PC
	160	W-4006 TEE 5/8 C X C X C	7305390	1.0	PC
	170	W-4041 TEE 7/8 X 5/8 X 7/8 C	7307402	1.0	PC
	180	W-1326 REDUCER 7/8 FTG X 5/8 C	7307140	1.0	PC
	190	W-1547 ADAPTER 7/8 FTG X 1/2 FPT	7307130	1.0	PC
	200	A-4780 CONNECTOR 1/2 FL X 1/2 MPT MUELLER	7640400	6.0	PC
	210	HOSEBARB 1/2 FFL X 1/2 HOSE BRS SWIVEL USE WITH 7504916 NO CLAMPS -USE WITH WEATHERHEAD HOSE	7504915	6.0	PC
	220	.5 PIPE WASHER FLUSH MOUNT	0442755	6.0	ASSEM
*	010	COUPLING 1/2 FPT X 1/2 FPT FULL SS 304SS	7204201	1.0	PC
*	020	SHEET 14 GA CR 201 SS 48 X 120	9521260	1.0	PC
*	230	TUBING 5/8 SOFT COPPER REFRIG.	7305000	8.0	PC

* PARTS NOT SHOWN ON DRAWING DETAIL

KOOLANT KOOLERS
Dimplex Thermal Solutions
SCHREIBER CHILLERS

DESIGN BY: RMS | DRAWN BY: RMS | KALAMAZOO, MI. PH (800) 968-5665 WWW.DIMPLEXTHERMAL.COM
DATE: 07/07/10 | PAGE 1 OF 1

WATER BYPASS PANEL 1/2"

PIPING

DRAWING NO. 445629