

# XPV

## VARIABLE SPEED CHILLERS



5 to 30 Tons of Cooling with Variable Speed Technology



XP	V	15	S	-	N	N	A	-	4
Family	Variable Series	Nom. Tonnage	System Type	-	Hydronic Type	Pump Type	Design Designation		Voltage: 460/60/3

Available Configurations									
XP	V	5	S	-	N,P,O	N,S,V	A	-	4
XP	V	10	S	-	N,P,O	N,S,V	A	-	4
XP	V	15	S	-	N,P,O	N,S,V	A	-	4
XP	V	10	D	-	N,P,O	N,S,D,V,Q	A	-	4
XP	V	20	D	-	N,P,O	N,S,D,V,Q	A	-	4
XP	V	30	D	-	N,P,O	N,S,D,V,Q	A	-	4

Nomenclature Legend	
System Type	S = Single Circuit
	D = Dual Circuit
Hydronic Type	N = No Hydronics (Flow Through)
	P = Pressurized Hydronic Package
	O = Open, Non-Pressurized Hydronic Package
Pump Type	N = No Pump
	S = Single Pump
	D = Redundant Dual Pumps
	V = Variable Speed Pump
	Q = Dual Variable Speed Pumps

STANDARD MODELS	
MODEL #	DESCRIPTION:
XPV5S-NNA-4	5T SINGLE, FLOW THROUGH
XPV10S-NNA-4	10T SINGLE, FLOW THROUGH
XPV15S-NNA-4	15T SINGLE, FLOW THROUGH
XPV5S-PSA-4	5T SINGLE, PRESSURIZED HYDRONICS
XPV10S-PSA-4	10T SINGLE, PRESSURIZED HYDRONICS
XPV15S-PSA-4	15T SINGLE, PRESSURIZED HYDRONICS
XPV5S-OSA-4	5T SINGLE, NON-PRESSURIZED HYDRONICS
XPV10S-OSA-4	10T SINGLE, NON-PRESSURIZED HYDRONICS
XPV15S-OSA-4	15T SINGLE, NON-PRESSURIZED HYDRONICS
XPV10D-NNA-4	10T DUAL, FLOW THROUGH
XPV20D-NNA-4	20T DUAL, FLOW THROUGH
XPV30D-NNA-4	30T DUAL, FLOW THROUGH
XPV10D-PSA-4	10T DUAL, PRESSURIZED HYDRONICS
XPV20D-PSA-4	20T DUAL, PRESSURIZED HYDRONICS
XPV30D-PSA-4	30T DUAL, PRESSURIZED HYDRONICS
XPV10D-OSA-4	10T DUAL, NON-PRESSURIZED HYDRONICS
XPV20D-OSA-4	20T DUAL, NON-PRESSURIZED HYDRONICS
XPV30D-OSA-4	30T DUAL, NON-PRESSURIZED HYDRONICS
XPV10D-PDA-4	10T DUAL, PRESS HYDRO W/ DUAL PUMP
XPV20D-PDA-4	20T DUAL, PRESS HYDRO W/ DUAL PUMP
XPV30D-PDA-4	30T DUAL, PRESS HYDRO W/ DUAL PUMP
XPV10D-ODA-4	10T DUAL, NON-PRESS HYDRO W/ DUAL PUMP
XPV20D-ODA-4	20T DUAL, NON-PRESS HYDRO W/ DUAL PUMP
XPV30D-ODA-4	30T DUAL, NON-PRESS HYDRO W/ DUAL PUMP

OPTIONS
Heresite Coating
1-1/2" Isolation Valves Loose
2" Isolation Valves Loose
1-1/2" Pressure Bypass Loose
2" Pressure Bypass Loose
1-1/2" Manual Bypass Loose
2" Manual Bypass Loose
BACnet IP
BACnet MSTP
Spare Parts Kit

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## Equipment Overview

Johnson Thermal Systems XPV Series chillers are designed to meet the needs of a diverse range of applications and industries. Each circuit features a variable speed, brushless DC compressor, that can modulate at speeds from 10% to 120% to precisely match the load requirements. Variable speed condenser fans come standard and provide adequate head pressure control in ambient temperatures as low as 0°F. The generously sized microchannel condenser allows for operation in ambient temperatures as high as 120°F. Variable speed technology is so quiet you can hardly notice when the machine is running. In addition to precise load matching and quiet operation, variable speed technology provides optimal energy efficiency allowing for rapid payback and a lifetime of savings. The XPV Series chillers have proven to be reliable, have a compact footprint and come at an affordable price point.

### Standard Features:

- Variable speed brushless DC compressor technology
- Variable speed ECM condenser fan
- Aluminum microchannel condenser
- Electronic expansion valve
- Microprocessor controls
- Phase loss monitor
- Non-fused disconnect
- Stainless steel brazed plate evaporator
- Copper piped hydronic circuit
- Flow switch for freeze protection
- Powder-coated cabinet

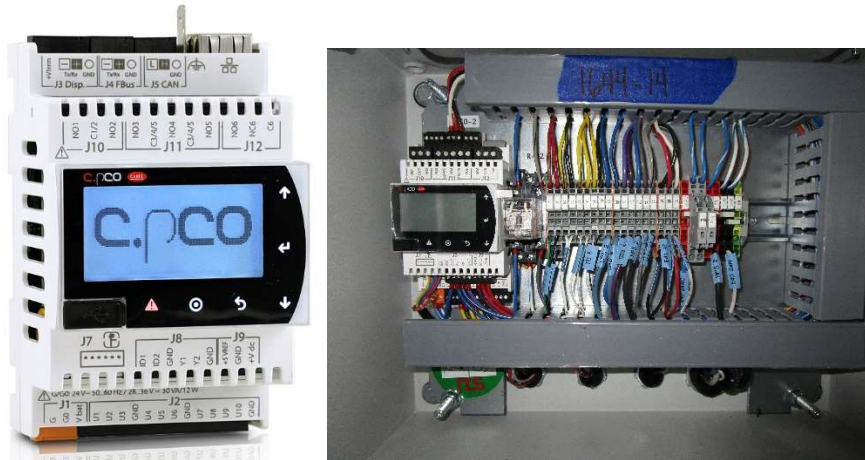


### Available Options:

- Single or dual circuit configurations
- Flow through, pressurized or non-pressurized hydronic packages
- Single pump, redundant dual pumps, variable speed pump, or redundant dual variable speed pumps
- Heresite coating for corrosion resistance
- Isolation, mechanical pressure bypass or manual bypass valves
- BACnet communications
- Service spare parts kit

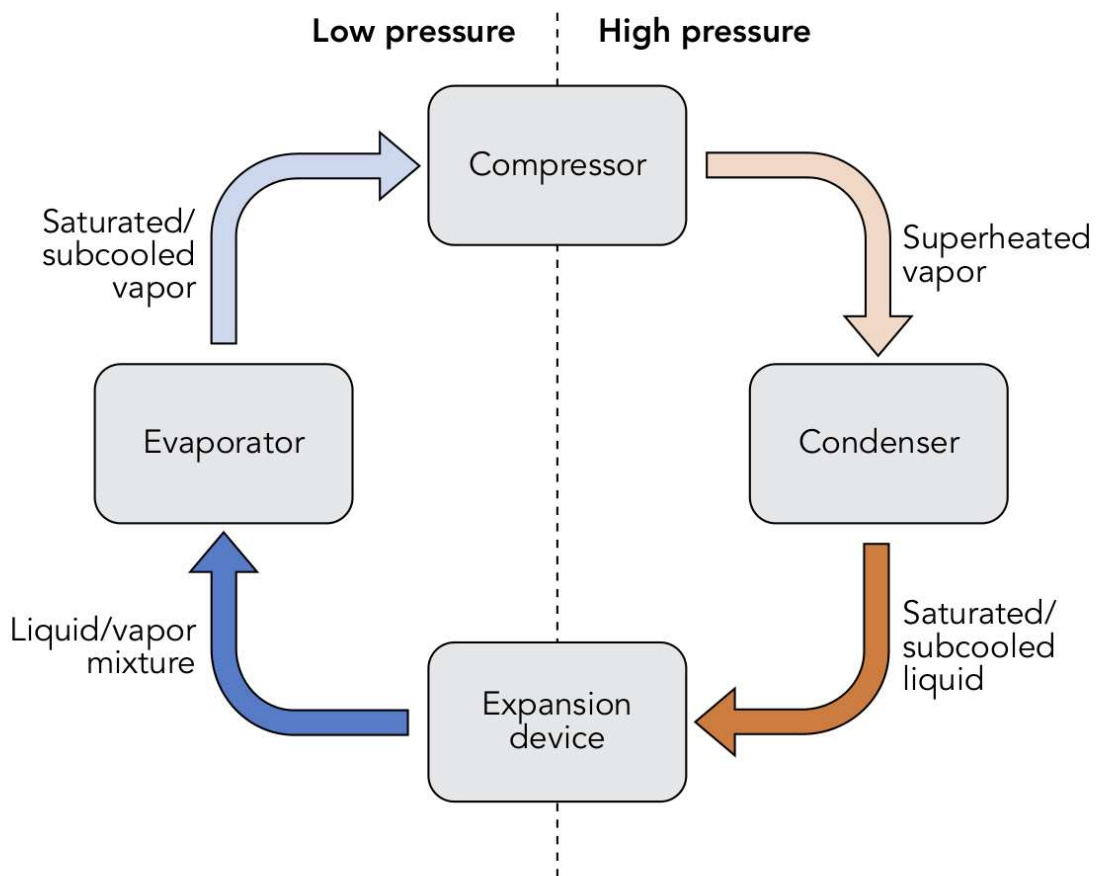
## Microprocessor Controls

Johnson Thermal Systems XPV Series chillers use the latest c.PCO controller technology from Carel. The XPV Series chiller controllers feature a built-in user interface along with external HMI display protected from the elements with a NEMA4x hinged window cover. The controller features a built in Ethernet port for local connectivity through a web-based interface. BACnet IP or MS/TP communication options are available.



## Refrigerant Circuit

Johnson Thermal Systems XPV Series chillers are designed for use with environmentally friendly R410A refrigerant. The BLDC scroll compressor is the heart of the refrigeration system, pumping refrigerant vapor to the condenser where heat is rejected to the outdoor ambient air. As heat is rejected, the refrigerant condenses into a liquid and is fed to the electronic expansion valve. The electronic expansion valve modulates to precisely control the rate of evaporation of the liquid refrigerant as it passes through the brazed plate evaporator. Superheated refrigerant vapor is returned to the compressor for another cycle. Through this process, heat is removed from the chilled water loop and rejected to outside ambient air.



**Performance Table: 30%PG, 100RPS**

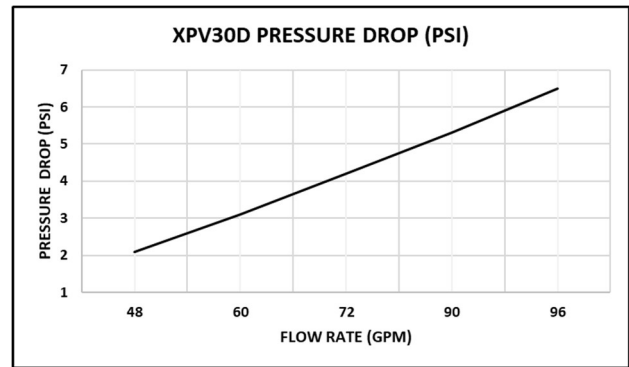
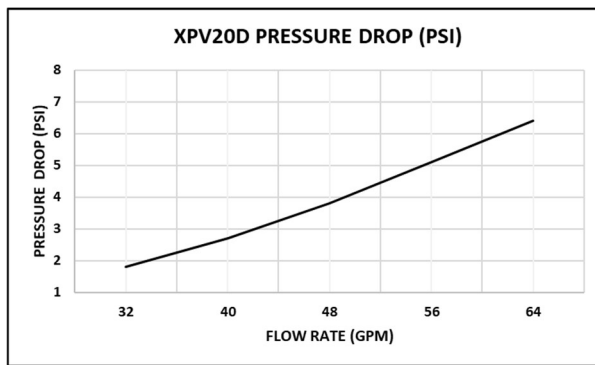
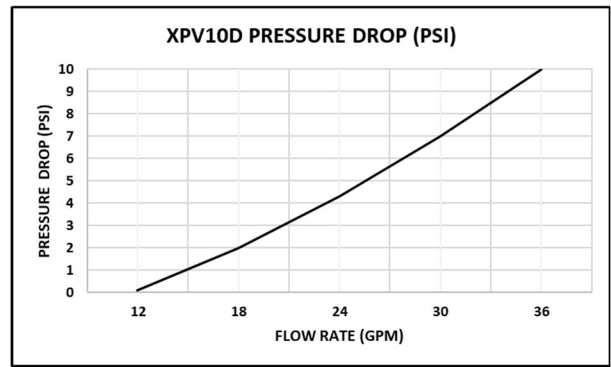
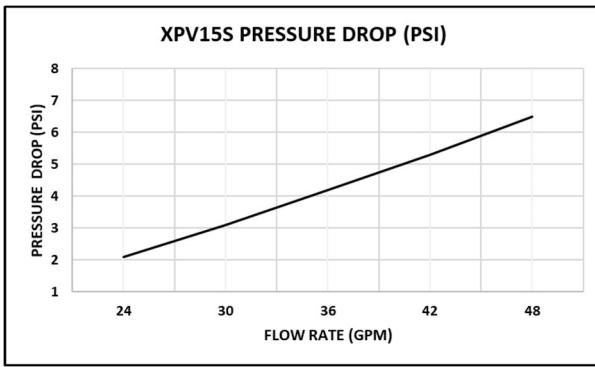
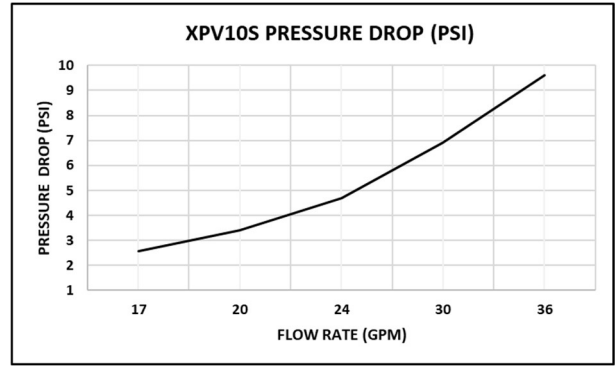
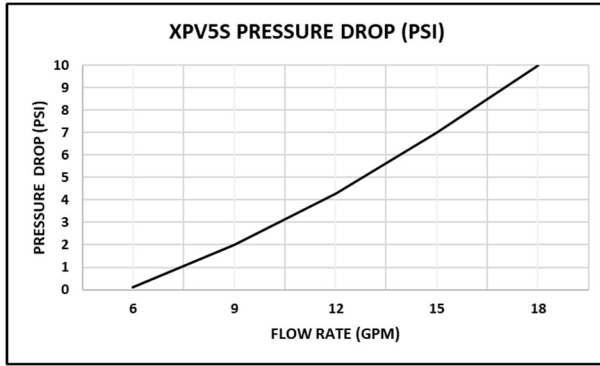
	MODEL #	105°F AMBIENT CAPACITY (BTU/HR)	95°F AMBIENT CAPACITY (BTU/HR)	85°F AMBIENT CAPACITY (BTU/HR)
45°F LWT	XPV5S	53184	57920	62371
	XPV10S	104306	111969	119356
	XPV15S	143283	153883	163754
	XPV10D	106368	115840	124742
	XPV20D	208612	223938	238712
	XPV30D	286566	307766	327508
40°F LWT	XPV5S	48163	52655	56813
	XPV10S	94884	102227	109178
	XPV15S	131005	140755	150018
	XPV10D	96326	105310	113626
	XPV20D	189768	204454	218356
	XPV30D	262010	281510	300036
35°F LWT	XPV5S	43447	47644	51614
	XPV10S	86127	93005	99673
	XPV15S	119471	128533	136914
	XPV10D	86894	95288	103228
	XPV20D	172254	186010	199346
	XPV30D	238942	257066	273828



### Performance Table (continued): 30%PG, 100RPS

	MODEL #	105°F AMBIENT CAPACITY (BTU/HR)	95°F AMBIENT CAPACITY (BTU/HR)	85°F AMBIENT CAPACITY (BTU/HR)
30°F LWT	XPV5S	39129	42989	46707
	XPV10S	78043	84468	90722
	XPV15S	108492	116686	124628
	XPV10D	78258	85978	93414
	XPV20D	156086	168936	181444
	XPV30D	216984	233372	249256
25°F LWT	XPV5S	35048	38694	42178
	XPV10S	70511	76499	82355
	XPV15S	98257	105743	113004
	XPV10D	70096	77388	84356
	XPV20D	141022	152998	164710
	XPV30D	196514	211486	226008
20°F LWT	XPV5S	31324	34693	37899
	XPV10S	63567	69246	74714
	XPV15S	88603	95571	102193
	XPV10D	62648	69386	75798
	XPV20D	127134	138492	149428
	XPV30D	177206	191142	204386

## Pressure Drop Curves:

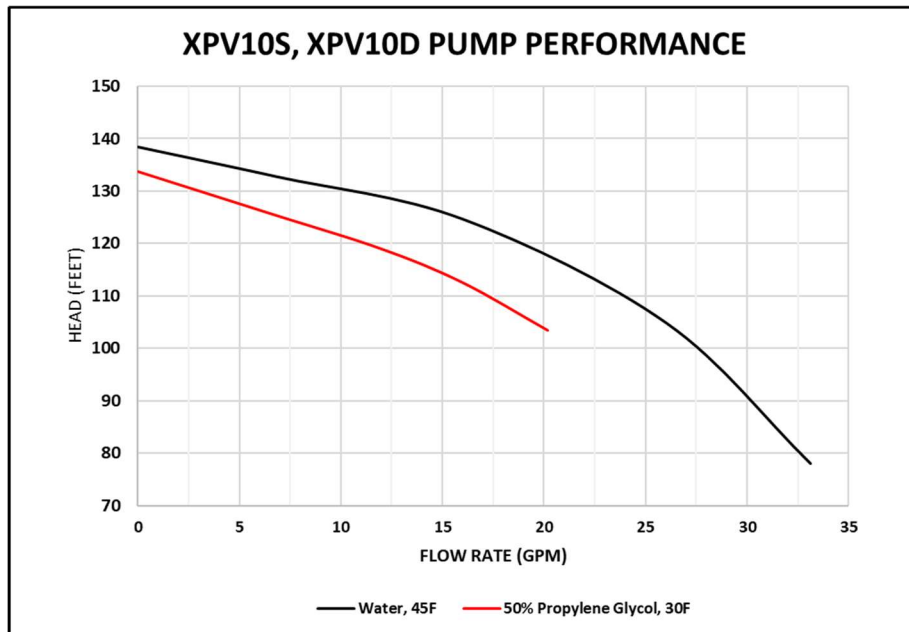
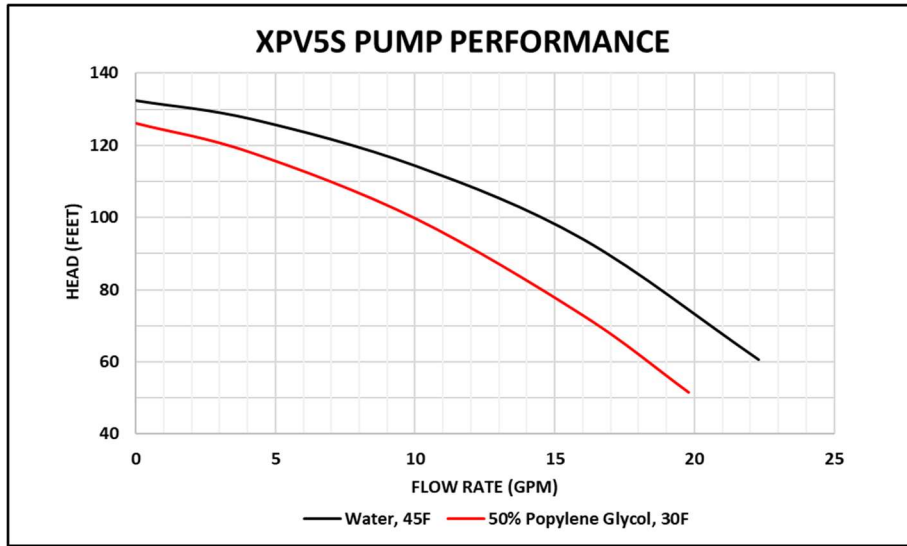


% PROPYLENE GLYCOL	0%	10%	20%	30%	40%	50%
PD CORRECTION FACTOR	1	1.078	1.157	1.288	1.414	1.605
FREEZE POINT (F)	32	26	19	8	-8	-31

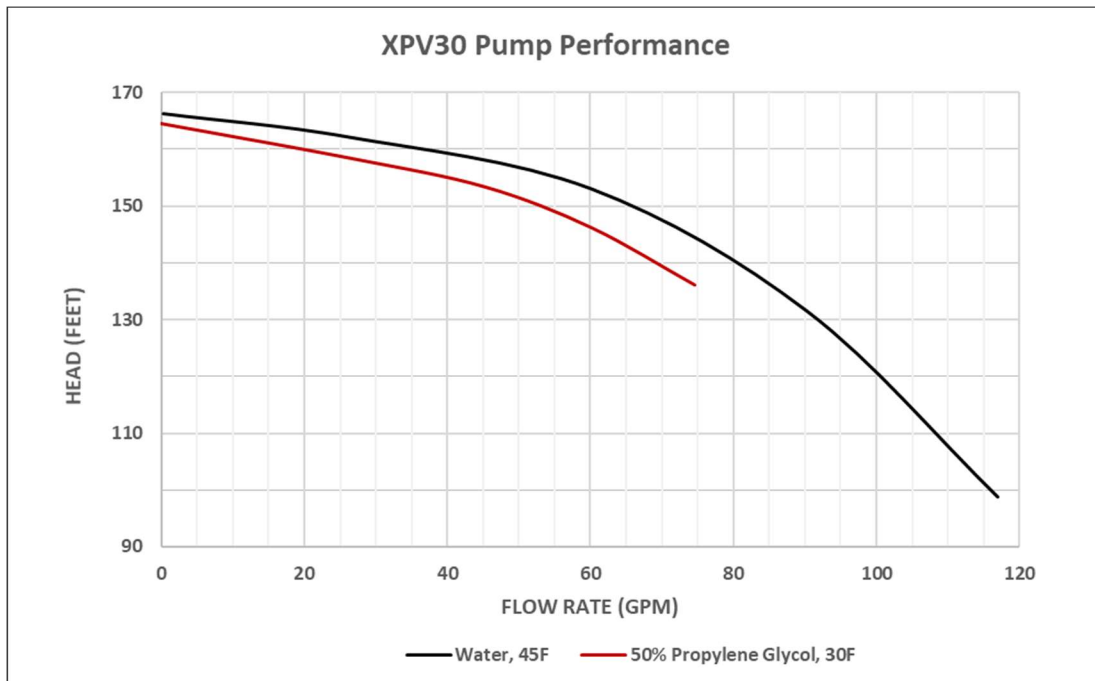
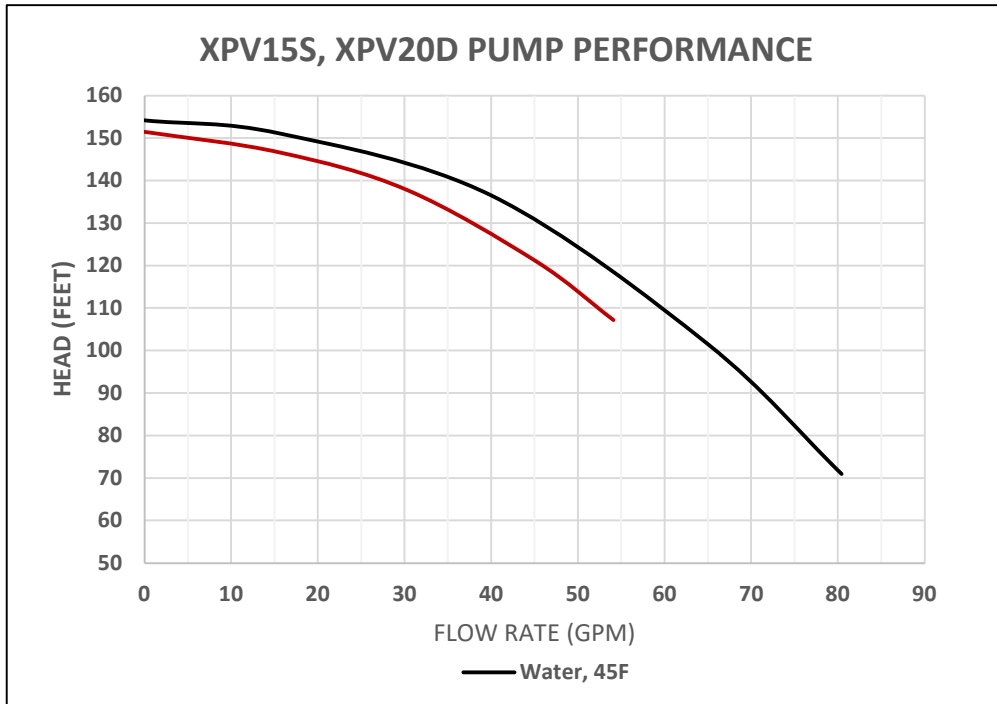
% ETHYLENE GLYCOL	0%	10%	20%	30%	40%	50%
PD CORRECTION FACTOR	1	1.095	1.191	1.302	1.435	1.599
FREEZE POINT (F)	32	26	16	4	-13	-36

CONVERSION		
PSI	1	0.433
FT	2.307	1

## Pump Curves: XPV5, XPV10S & XPV10D

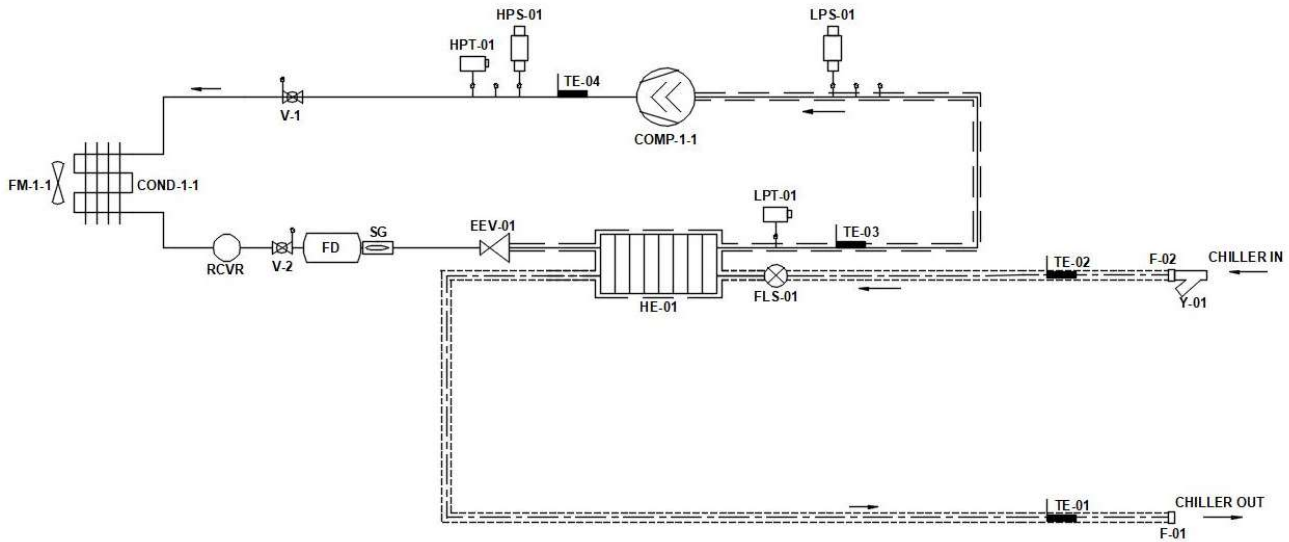


**Pump Curves: XPV15S, XPV20D, XPV30D**



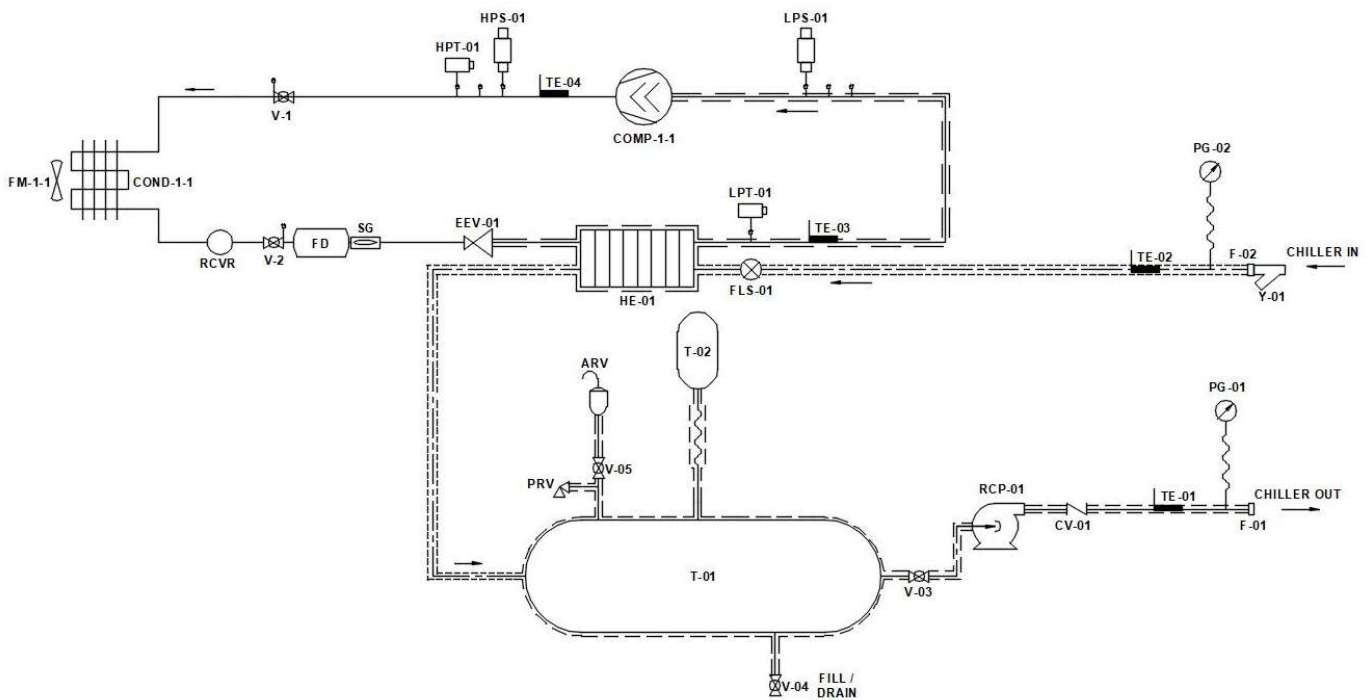
## Hydronic Arrangement: Flow Through

Johnson Thermal Systems XPV Series chillers come standard in three different hydronic piping arrangements. Flow through is the most basic lowest cost piping arrangement. Flow through hydronics consist of a wye strainer, temperature sensors, flow switch and brazed plate heat exchanger. Pumps, buffer tanks and all other hydronic components are field provided if required.



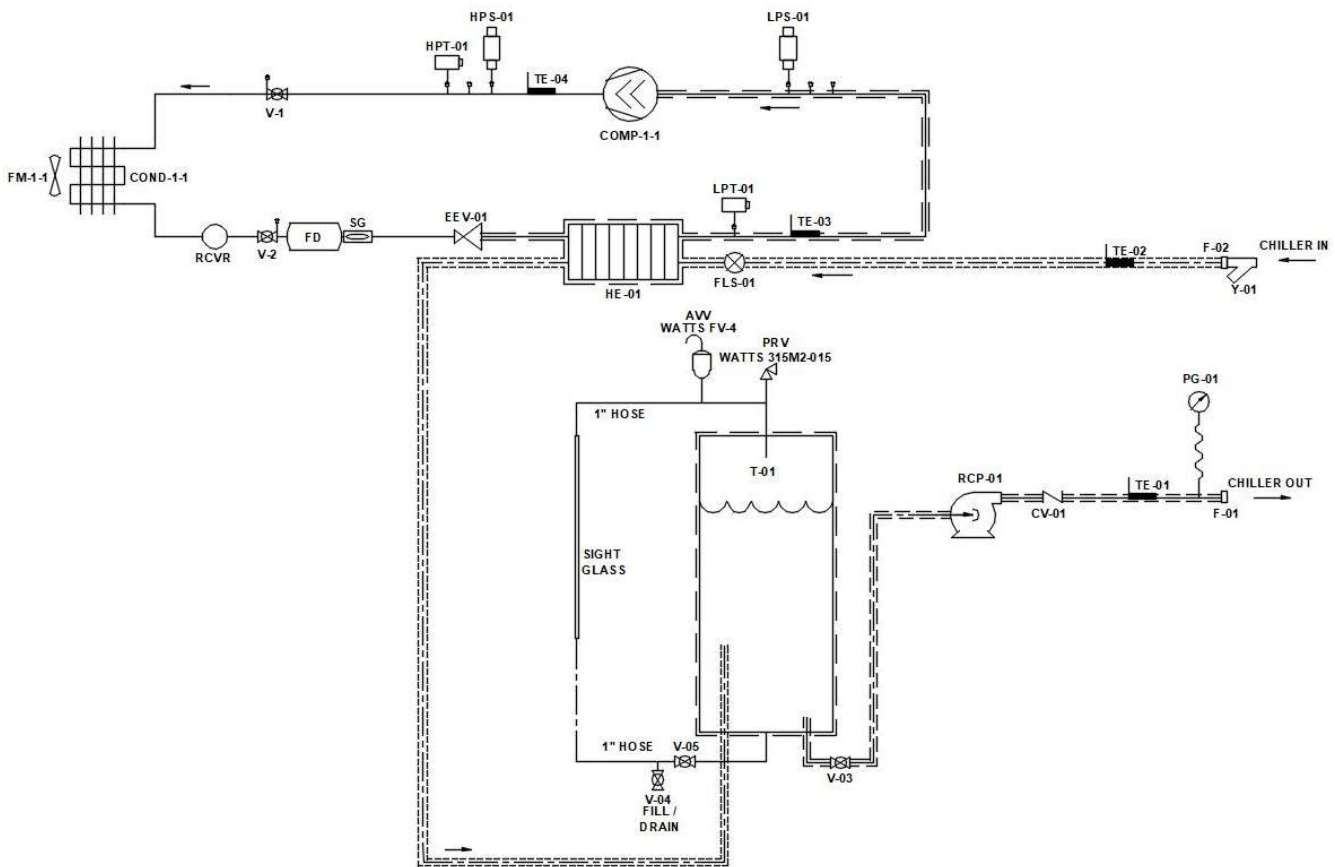
## Hydronic Arrangement: Pressurized

Johnson Thermal Systems XPV Series chillers come standard in three different hydronic piping arrangements. The pressurized hydronic package simplifies installation by factory installing most of hydronic components inside the chiller. The pressurized hydronic package includes a pump, stainless steel pressurized buffer tank, expansion tank, pressure relief valve (75PSI), automatic air vent, wye strainer, temperature sensors, flow switch, brazed plate heat exchanger, isolation valves and inlet / outlet pressure gauges.



## Hydronic Arrangement: Non-Pressurized

Johnson Thermal Systems XPV Series chillers come standard in three different hydronic piping arrangements. The non-pressurized hydronic package simplifies installation by factory installing most of hydronic components inside the chiller. The non-pressurized hydronic package includes a pump, stainless steel non-pressurized buffer tank, tank level sight glass, pressure relief valve (15PSI), vacuum breaker, wye strainer, temperature sensors, flow switch, brazed plate heat exchanger, isolation valves and outlet pressure gauge. This proprietary piping design is JTS's version of an open to atmosphere system, of which is closed and non-pressurized. Our simple, yet superior design can tolerate 30FT of vertical overhead piping without overflowing the tank.



### **Pump Option: Single Pump**

When ordered with either a pressurized or non-pressurized hydronic package, Johnson Thermal Systems XPV Series chillers come standard with four different pump options. The most basic, lowest cost pump option is the single pump. The single pump option includes a fixed speed Grundfos pump, installed, piped, wired, and tested at our factory. Each pump features a stainless-steel impeller and stainless-steel housing.



### **Pump Option: Redundant Dual Pumps**

When ordered with either a pressurized or non-pressurized hydronic package, Johnson Thermal Systems XPV Series chillers come standard with four different pump options. For mission-critical applications, JTS offers a redundant pump package that features two pumps installed in parallel, controlled to rotate based upon run hours. Should a flow fault be detected, JTS controller automatically switches to the standby pump to correct the fault. Each pump features a stainless-steel impeller, stainless-steel housing, isolation and check valves.





### **Pump Option: Variable Speed Pump**

When ordered with either a pressurized or non-pressurized hydronic package, Johnson Thermal Systems XPV Series chillers come standard with four different pump options. To allow fine tuning of the flow rate, JTS offers a Grundfos pump with built in VFD option. Operation of the VFD is manually set in the field by setting the inverter frequency to that, that best matches the application. Each pump features a stainless-steel impeller, stainless-steel housing and is adjustable between 360 to 4000 RPM.



### **Pump Option: Redundant Dual Variable Speed Pumps**

When ordered with either a pressurized or non-pressurized hydronic package, Johnson Thermal Systems XPV Series chillers come standard with four different pump options. For mission-critical applications, JTS offers a variable speed redundant pump package that features two VFD driven pumps installed in parallel, controlled to rotate based upon run hours. Should a flow fault be detected, JTS controller automatically switches to the standby pump to correct the fault. Operation of the VFD is manually set in the field by setting the inverter frequency to that, that best matches the application. Each pump features a stainless-steel impeller, stainless-steel housing, isolation valves, check valves, and is adjustable between 360 to 4000 RPM.



## Hydronic Specifications:

	PRIMARY PUMP (OPTIONAL)						TANK SIZE (OPTIONAL)	FLOW RATE		NOMINAL FLOW RATE	NOMINAL PRESSURE DROP
	MN	JTS PN	GPM	FT	HP	FLA	GAL	MIN	MAX	GPM	FT
XPV5S	CM3-3	5000-0631	12	108	1	1.8	20	6	18	12	10.04
XPV10S	CM5-3	5000-0279	24	110	1.5	2.65	40	16	32	24	8.75
XPV15S	CM10-2	5000-0453	36	140	3.5	3.4	40	24	48	36	9.83
XPV10D	CM5-3	5000-0279	24	110	1.5	2.65	40	12	36	24	10.04
XPV20D	CM10-2	5000-0453	48	125	3.5	3.4	60	32	64	48	8.75
XPV30D	CM15-2	5000-0458	72	148	5.5	7.2	60	48	96	72	9.83

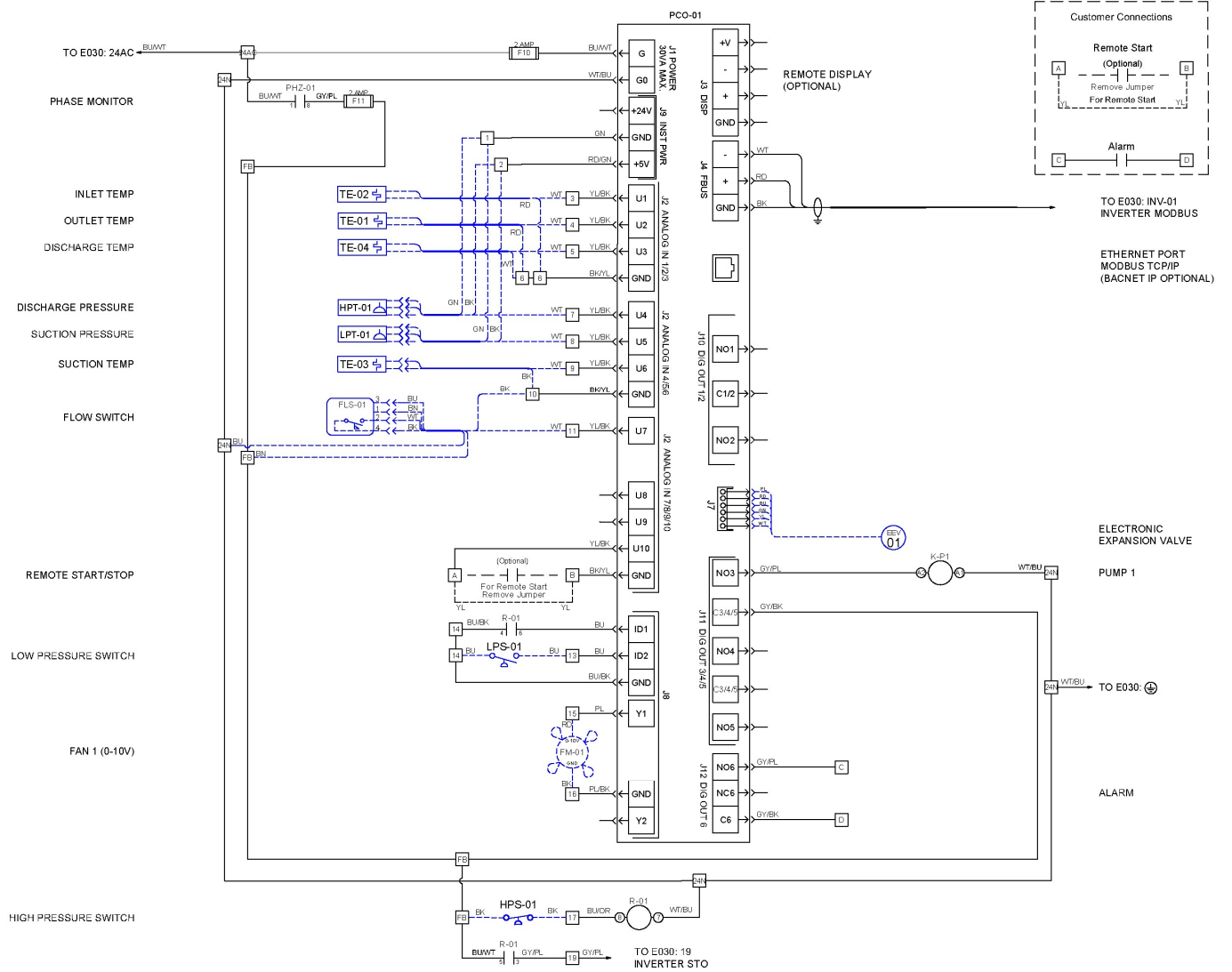
## System Specifications:

	COMPRESSOR	FAN	AIR FLOW	CONNECTION SIZE	CONNECTION TYPE	DRY WEIGHT	CABINET
	QTY	QTY	SCFM	IN	TYPE	LBS	CODE
XPV5S	1	1	5000	1.5	FPT	1050	1AS1
XPV10S	1	1	10000	2	FPT	1300	1SB1
XPV15S	1	1	10000	2	FPT	1500	1M1
XPV10D	2	2	10000	1.5	FPT	2100	2AS2
XPV20D	2	2	20000	2	FPT	2600	2SB2
XPV30D	2	2	20000	2	FPT	3000	2M2

## Electrical Specifications:

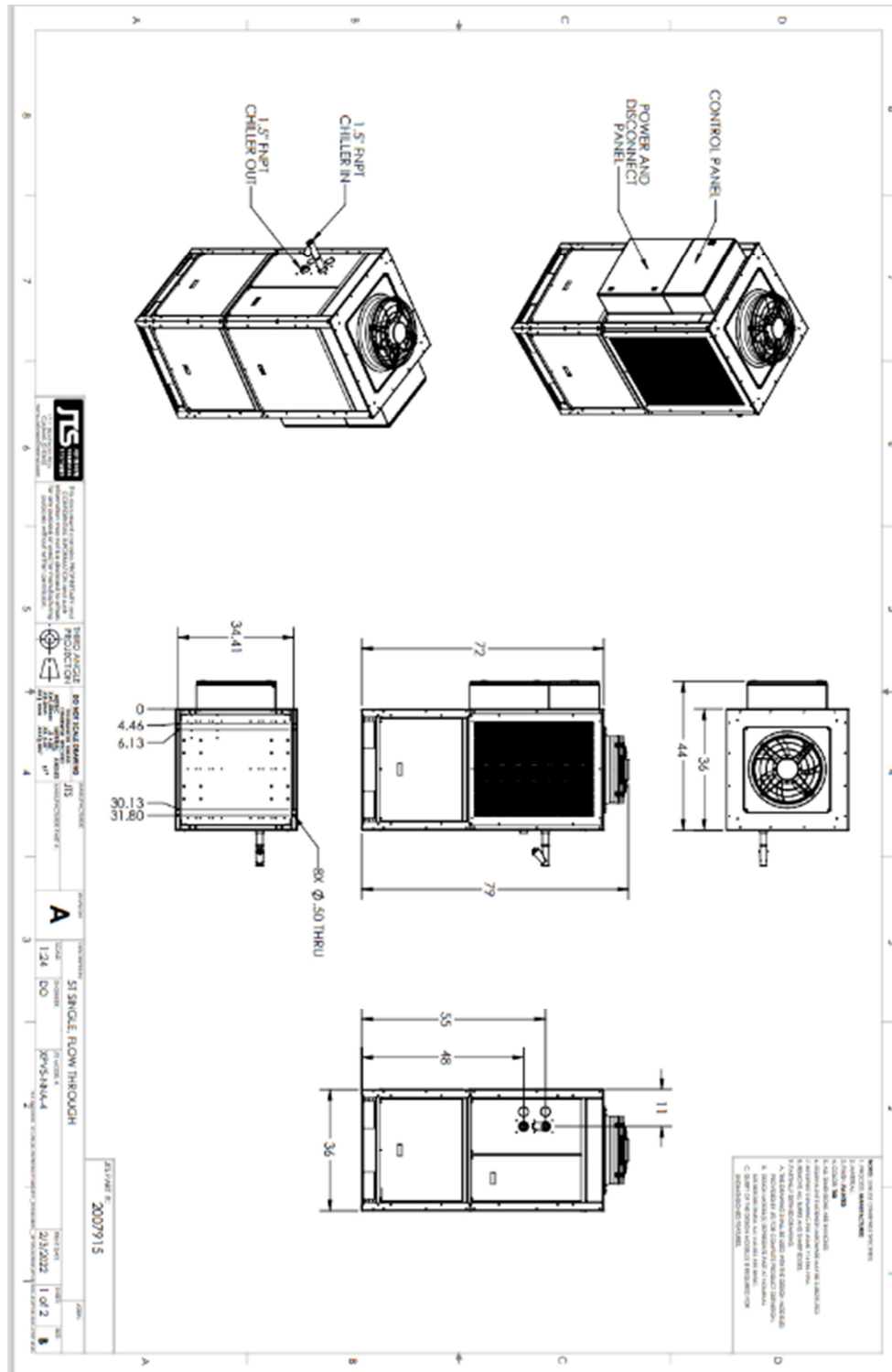
ELECTRICAL DATA - 460/60/3, 5kA SSCR										
	CHILLER	COMP 1 RLA	COMP 2 RLA	COMP	CONDENSER FAN FLA	CONDENSER FAN	CONTROL 24VAC	PUMP FLA (OPTIONAL)	MCA	MOPD
	MODEL	AMPS	AMPS	QTY	AMPS	QTY	AMPS	LBS	AMPS	AMPS
NO PUMP	XPV5S	11.5	-	1	1.4	1	0.5	-	16	25
	XPV10S	22.4	-	1	4.4	1	0.5	-	33	50
	XPV15S	27.6	-	1	4.4	1	0.5	-	39	60
	XPV10D	11.5	11.5	2	1.4	2	1	-	30	40
	XPV20D	22.4	22.4	2	4.4	2	1	-	60	80
	XPV30D	27.6	27.6	2	4.4	2	1	-	72	90
PUMP (OPTIONAL)	XPV5S	11.5	-	1	1.4	1	0.5	1.8	18	25
	XPV10S	22.4	-	1	4.4	1	0.5	2.7	36	50
	XPV15S	27.6	-	1	4.4	1	0.5	3.4	43	70
	XPV10D	11.5	11.5	2	1.4	2	1	2.7	32	40
	XPV20D	22.4	22.4	2	4.4	2	1	3.4	64	80
	XPV30D	27.6	27.6	2	4.4	2	1	7.2	79	100

# Typical Wiring Diagram:

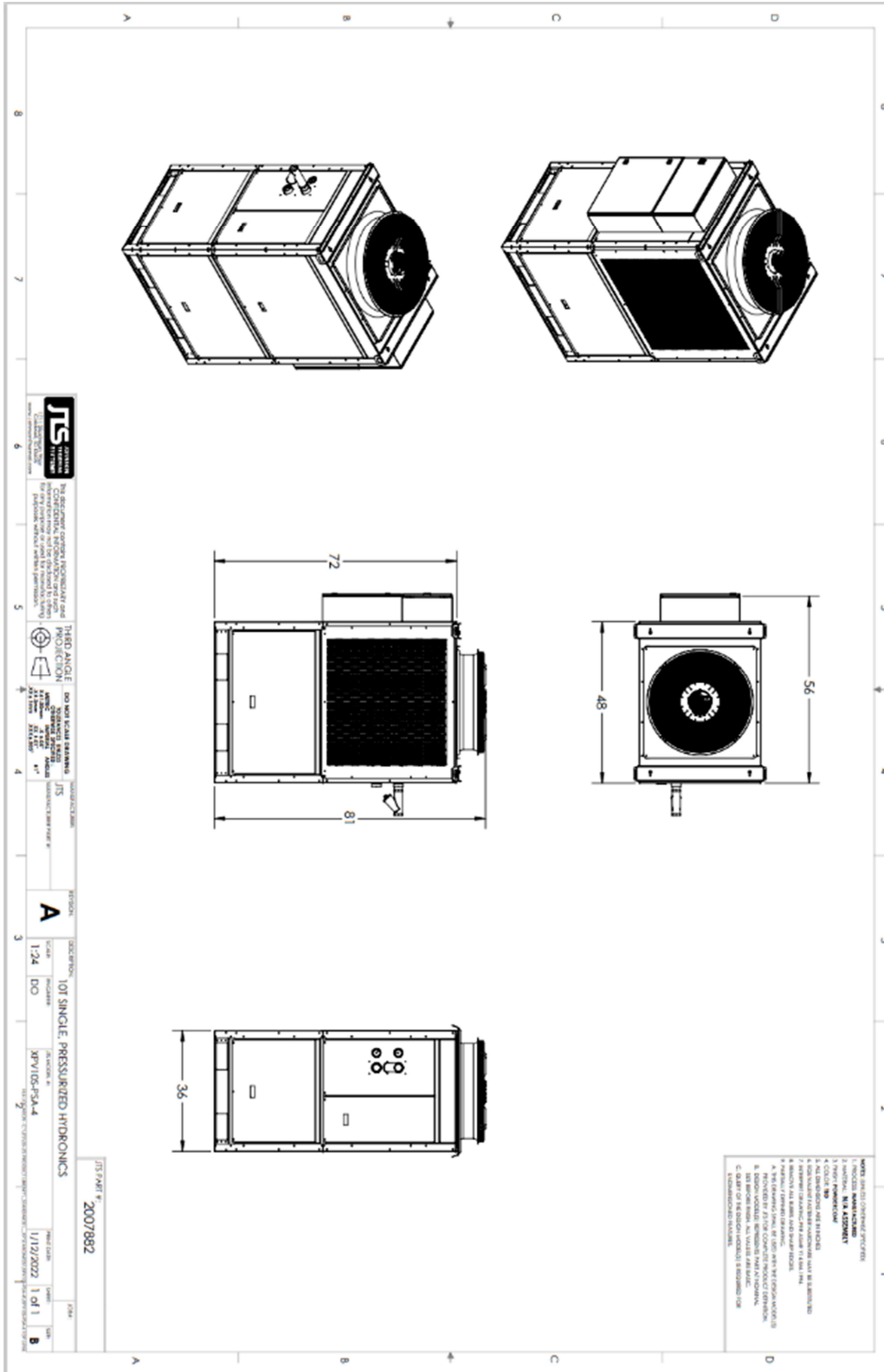


**Cabinet Drawings:**

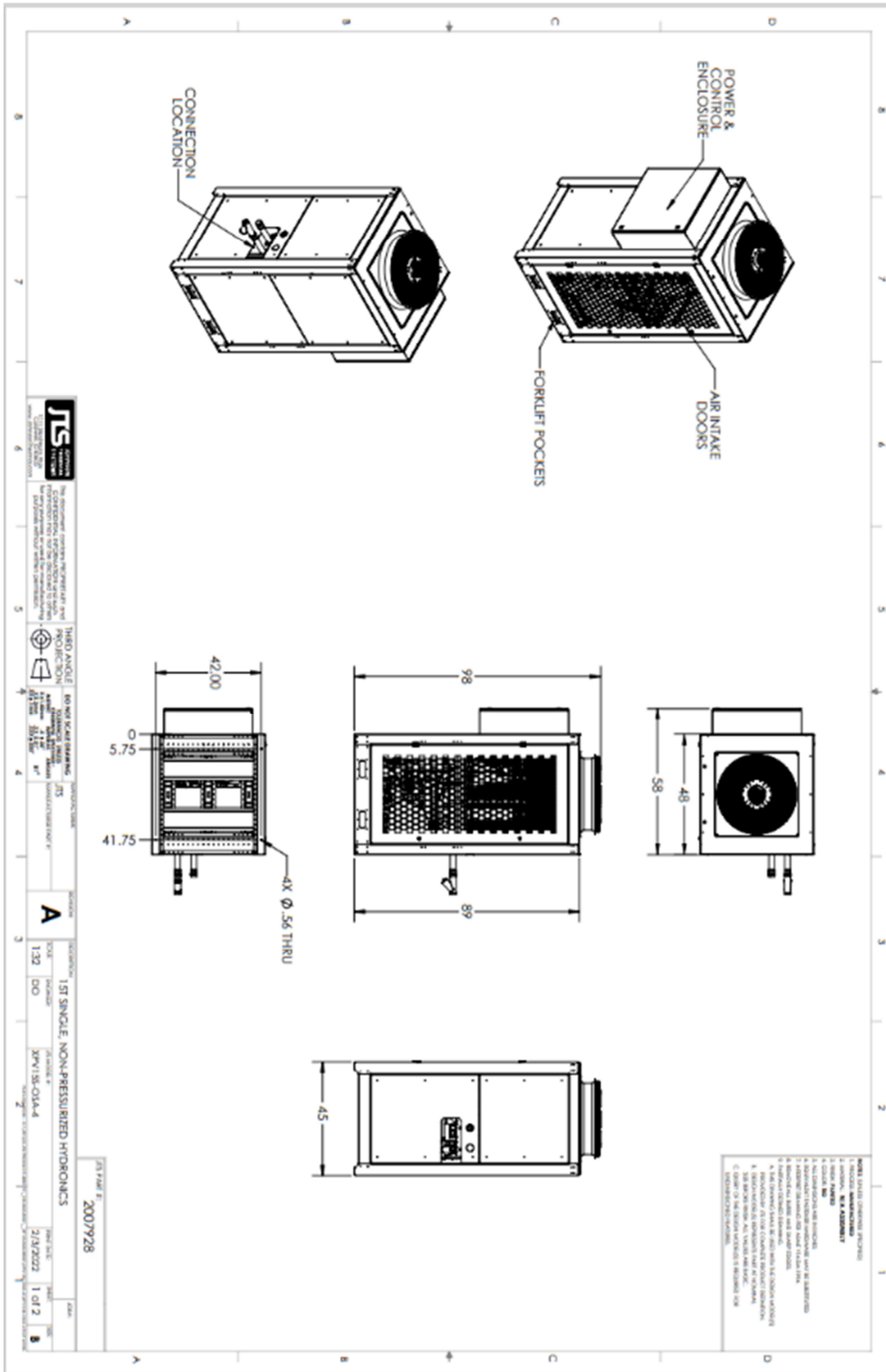
**XPV5S**



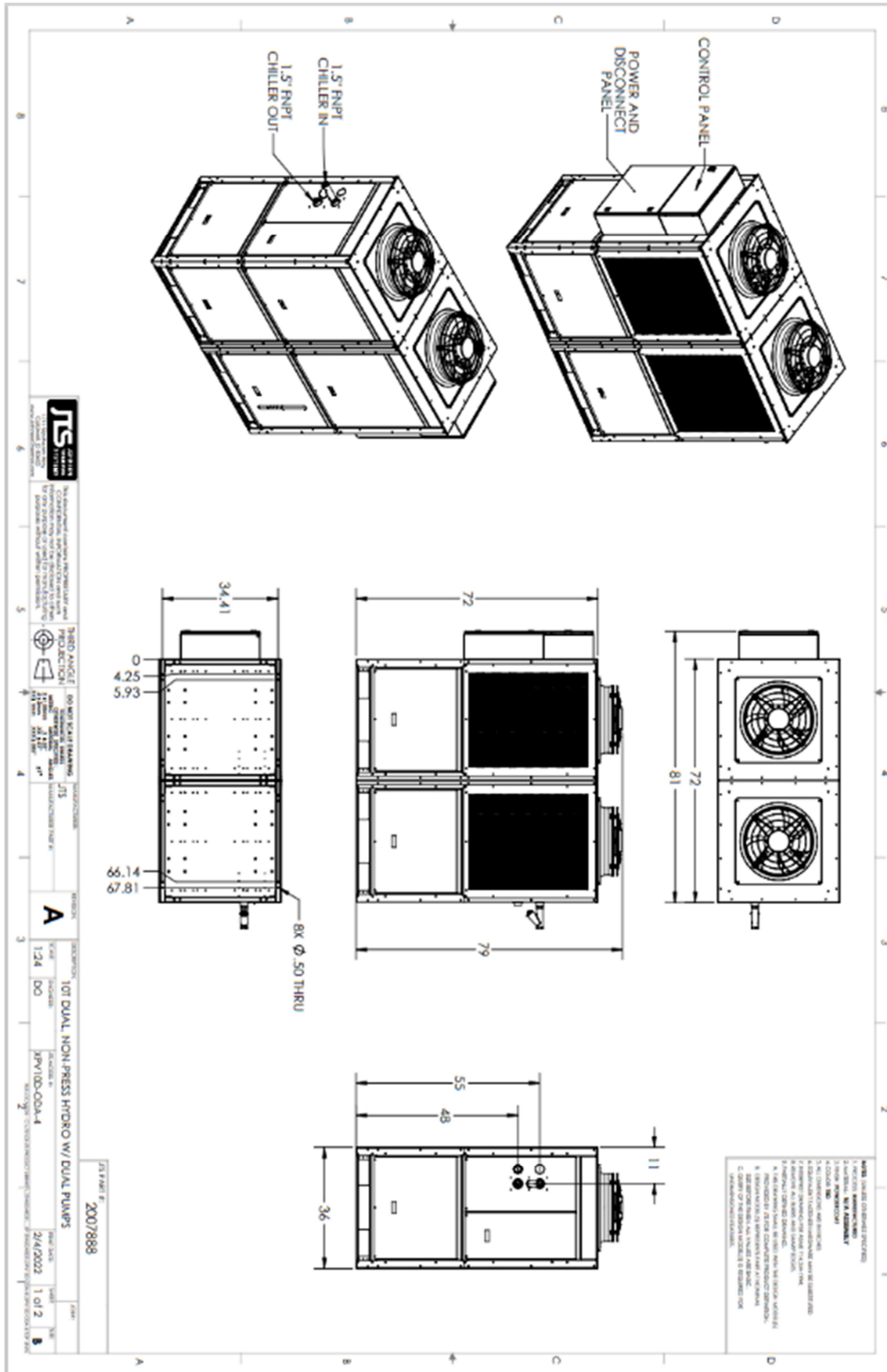
**XPV10S**



# XPV15S



# XPV10D



# XPV20D & XPV30D

