



VSD—3R Series

Variable Speed Drives

Motor Controls VSD series of a package variable speed drive panel using the *Danfoss VLT Aqua drive*.® The VSD series panel comes standard enclosed in a NEMA 3R UL listed enclosure with Heat Guard finish and filtered cooling fan.

FEATURES

- **UL LISTED** Single Phase Conversion
- **UL LISTED** as Service Entrance Equipment
- Wide Range of Voltage Inputs
 - 480— 342-528
 - 230— 180-264
- 1000 Ft Motor Cable Length—No Load Reactors



VARI-SMART Pump Control

- Constant Pressure with Variable Flow
- Well Draw Down Control
- Operate Pump at BEP
- Empty Pipe Fill Mode
- Dry Pump Detection
- Automatic Energy Optimization
- End of Pump Curve Detection
- Auto Tuning



Optional

6 YEAR Warranty
Including
lightning strikes



1-800-735-1097 | Fax: 972-247-8991 | www.motorcontrols.com



VSD—3R Series

Variable Speed Drives

FEATURES

- UL listed and suitable for use as service equipment
- NEMA type 3R steel enclosure
 - Heat Guard solar white powder coating finish
 - Fan and filter provided as standard feature for heat dissipation
 - Full **foam in place** gasket hinged door with provision for a padlock
 - Keypad sun shield with provision for a padlock
 - 122 °F(50°C) outside temperature , non direct sunlight
- Heavy duty flange fusible or circuit breaker disconnect switch.
- **Danfoss VLT Aqua Drive®**
 - Thermal protection of the drive & motor with short circuit protection.
 - Conformal Coated PCBs
 - Input DC-Link Reactors
 - Eliminate need for AC Line Reactors
 - Minimize Harmonic Distortion
 - Maximize Power Factor
 - Motor Winding PreHeat
 - Motor Thermistor Monitoring
 - Single-phase line supply
 - Graphical Display
 - status messages, trend graph, payback & cost savings
 - Remote Communications





Options & Accessories

Catalog Number Explanation

VSDP	4	5	N3	CB	Options
Variable Speed Drive Panel					
Voltage					
4 = 460 V 3P					
2 = 230 V 3P					
14 = 460 V 1P					
12 = 230 V 1P					
Horsepower 2-500					
Enclosure Type					
N3 = Nema 3R Outdoor					
Main Disconnect					
CB = Circuit Breaker					
FD = Fused Disconnect					
Options	Code	List Price			
Surge Arrestor	SA	\$	476		
Interior Light with on/off switch	EL	\$	245		
Heater 200W w/Thermostat	EH	\$	646		
HOA Switch	SS	\$	187		
Manual Speed Pot	SP	\$	271		
Reset Push Button Switch	RP	\$	161		
White Pilot Light - Power On	WP	\$	181		
Green Pilot Light - Drive Run	GP	\$	181		
Red Pilot Light - Drive Off	RP	\$	181		
Yellow Pilot Light - Drive Fault	YP	\$	181		

Add Multiple Codes with a dash between option code

Part Number	Accessories	List Price
2091100PG2M11A1	Pressure Transmitter 0-100 PSIG 4-20mA	\$ 697
2091250PG2M11A1	Pressure Transmitter 0-250 PSIG 4-20mA	\$ 697
AL150.25420160	Submersible Level Transmitter 0-150 Ft 4-20mA	\$ 2,106
AL300.25420310	Submersible Level Transmitter 0-300 Ft 4-20mA	\$ 2,876
AL450.25420460	Submersible Level Transmitter 0-450 Ft 4-20mA	\$ 3,645

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Fusible Disconnect—Main Disconnect

MCI Part Number	Max. HP	Input Volts	Fused Disc. Size	Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP4005N3FD	5	460	15	8	34" x 16" x 12"	95	\$ 6,130
VSDP4007N3FD	7.5		20	11	34" x 16" x 12"	100	\$ 6,460
VSDP4010N3FD	10		25	15	34" x 16" x 12"	100	\$ 6,840
VSDP4015N3FD	15		30	21	34" x 16" x 12"	115	\$ 7,430
VSDP4020N3FD	20		40	27	34" x 16" x 12"	135	\$ 8,320
VSDP4025N3FD	25		50	34	34" x 16" x 12"	135	\$ 9,610
VSDP4030N3FD	30		60	40	46" x 24" x 16"	150	\$ 11,110
VSDP4040N3FD	40		80	52	46" x 24" x 16"	150	\$ 13,020
VSDP4050N3FD	50		100	65	46" x 24" x 16"	175	\$ 14,740
VSDP4060N3FD	60		100	80	46" x 24" x 16"	175	\$ 16,450
VSDP4075N3FD	75		150	105	46" x 24" x 16"	175	\$ 19,140
VSDP4100N3CB	100		175	130	58" x 24" x 16"	250	\$ 22,170
VSDP4125N3FD	125		200	160	58" x 24" x 16"	250	\$ 25,840
VSDP4150N3CB	150		250	190	58" x 24" x 16"	385	\$ 30,550
VSDP4200N3FD	200		350	240	58" x 24" x 16"	394	\$ 35,800
VSDP4250N3FD	250		400	303	72" x 24" x 18"	475	\$ 52,410
VSDP4300N3FD	300		600	361	72" x 24" x 18"	486	\$ 62,550
VSDP4350N3FD	350		600	443	72" x 24" x 18"	500	\$ 68,800
VSDP4450N3FD	450		800	540	72" x 34" x 24"	600	\$ 83,950
VSDP4500N3FD	500		800	590	72" x 34" x 24"	615	\$ 94,260

Notes:

- Size the VSDP based on the maximum current requirements and not based on HP rating.
- Refer to notes on sizing VSDP and table VSDP-1 for possible maximum amp requirements per different motor type and pumping applications.
- Fuses are included in pricing.



Circuit Breaker—Main Disconnect

MCI Part Number	Max. HP	Input Volts	Breaker Size	Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP4005N3CB	5	460	15	8	34" x 16" x 12"	95	\$ 6,670
VSDP4007N3CB	7.5		20	11	34" x 16" x 12"	100	\$ 6,970
VSDP4010N3CB	10		25	15	34" x 16" x 12"	100	\$ 7,360
VSDP4015N3CB	15		30	21	34" x 16" x 12"	115	\$ 7,990
VSDP4020N3CB	20		60	27	34" x 16" x 12"	135	\$ 8,820
VSDP4025N3CB	25		60	34	34" x 16" x 12"	135	\$ 10,140
VSDP4030N3CB	30		60	40	46" x 24" x 16"	150	\$ 11,740
VSDP4040N3CB	40		90	52	46" x 24" x 16"	150	\$ 13,520
VSDP4050N3CB	50		100	65	46" x 24" x 16"	175	\$ 16,240
VSDP4060N3CB	60		125	80	46" x 24" x 16"	175	\$ 17,760
VSDP4075N3CB	75		125	105	46" x 24" x 16"	175	\$ 20,740
VSDP4100N3CB	100		200	130	58" x 24" x 16"	250	\$ 24,930
VSDP4125N3CB	125		225	160	58" x 24" x 16"	250	\$ 28,230
VSDP4150N3CB	150		250	190	58" x 24" x 16"	385	\$ 30,780
VSDP4200N3CB	200		350	240	58" x 24" x 16"	394	\$ 38,210
VSDP4250N3CB	250		400	303	72" x 24" x 18"	475	\$ 50,630
VSDP4300N3CB	300		600	361	72" x 24" x 18"	486	\$ 61,110
VSDP4350N3CB	350		600	443	72" x 24" x 18"	500	\$ 71,830
VSDP4450N3CB	450		800	540	72" x 34" x 24"	600	\$ 83,980
VSDP4500N3CB	500		800	590	72" x 34" x 24"	615	\$ 94,290

Notes:

- Size the VSDP based on the maximum current requirements and not based on HP rating.
- Refer to notes on sizing VSDP and table VSDP-1 for possible maximum amp requirements per different motor type and pumping applications.



Fusible Disconnect—Main Disconnect

MCI Part Number	Max. HP	Input Volts	Fused Disc. Size	Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP2002N3FD	2	230	10	7.5	34" x 16" x 14"	133	\$ 5,560
VSDP2003N3FD	3		15	10.6	34" x 16" x 14"	133	\$ 5,740
VSDP2005N3FD	5		25	16.7	34" x 16" x 14"	133	\$ 6,166
VSDP2007N3FD	7.5		30	24.2	34" x 16" x 14"	139	\$ 6,750
VSDP2010N3FD	10		40	30.8	34" x 16" x 14"	139	\$ 7,130
VSDP2015N3FD	15		60	46.2	34" x 16" x 14"	139	\$ 8,070
VSDP2020N3FD	20		80	59.4	46" x 24" x 16"	150	\$ 9,220
VSDP2025N3FD	25		100	74.8	46" x 24" x 16"	175	\$ 10,460
VSDP2030N3FD	30		150	88.0	46" x 24" x 16"	175	\$ 11,910
VSDP2040N3FD	40		150	115.0	46" x 24" x 16"	175	\$ 14,270
VSDP2050N3FD	50		200	143.0	58" x 24" x 16"	250	\$ 17,070
VSDP2060N3FD	60		200	170.0	58" x 24" x 16"	250	\$ 19,160

Circuit Breaker—Main Disconnect

MCI Part Number	Max. HP	Input Volts	Circuit Breaker Size	Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP2002N3CB	2	230	15	7.5	34" x 16" x 14"	133	\$ 6,000
VSDP2003N3CB	3		20	10.6	34" x 16" x 14"	133	\$ 6,180
VSDP2005N3CB	5		30	16.7	34" x 16" x 14"	133	\$ 6,500
VSDP2007N3CB	7.5		50	24.2	34" x 16" x 14"	139	\$ 7,120
VSDP2010N3CB	10		60	30.8	34" x 16" x 14"	139	\$ 7,620
VSDP2015N3CB	15		60	46.2	34" x 16" x 14"	139	\$ 8,710
VSDP2020N3CB	20		100	59.4	46" x 24" x 16"	150	\$ 9,710
VSDP2025N3CB	25		100	74.8	46" x 24" x 16"	175	\$ 10,960
VSDP2030N3CB	30		150	88.0	46" x 24" x 16"	175	\$ 12,410
VSDP2040N3CB	40		150	115.0	46" x 24" x 16"	175	\$ 15,930
VSDP2050N3CB	50		200	143.0	58" x 24" x 16"	250	\$ 18,800
VSDP2060N3CB	60		250	170.0	58" x 24" x 16"	250	\$ 21,190

Notes:

- Please refer to notes on VSDP Selection and Table VSDP-1 when sizing VSD.
- Fuses are included in pricing.

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Fusible Disconnect type Single-Phase Input, Three Phase Output

Phase conversion and speed control in a single, compact package.

Applications where three-phase power is not available, a UL-listed phase converting VLT Aqua Drives can control three-phase motors using single-phase 240V or 480V service. Since three-phase motors are more readily available and less expensive, a variable speed drive can be a cost-effective solution in these applications while providing an attractive alternative to conventional phase conversion devices.

MCI Part Number	Max. HP	1 phase Input Voltage	Fused Disc. Size	Drive Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP1202N3FD	2	230	30	7.5	34" x 16" x 14"	150	\$ 6,110
VSDP1203N3FD	3		30	10.6	34" x 16" x 14"	150	\$ 6,450
VSDP1205N3FD	5		40	16.7	34" x 16" x 14"	150	\$ 8,410
VSDP1207N3FD	7.5		60	24.2	34" x 16" x 14"	150	\$ 9,130
VSDP1210N3FD	10		60	30.8	46" x 24" x 16"	175	\$ 10,640
VSDP1220N3FD	20		150	59.4	46" x 24" x 16"	225	\$ 15,370
VSDP1230N3FD	30		200	88	58" x 24" x 16"	275	\$ 22,160

MCI Part Number	Max. HP	1 phase Input Voltage	Fused Disc. Size	Drive Max. Amps	Enclosure Size H x W x D	Weight	List Price
VSDP1410N3FD	10	460	40	15	34" x 16" x 14"	150	\$ 9,940
VSDP1415N3FD	15		50	21	46" x 24" x 16"	175	\$ 13,350
VSDP1425N3FD	25		80	34	46" x 24" x 16"	225	\$ 17,370
VSDP1450N3FD	50		150	65	58" x 24" x 16"	275	\$ 26,860

Notes:

- Please refer to notes on VSDP Selection and Table VSDP-1 when sizing VSD.
- Fuses are included in pricing.

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VSDP Sizing & Selection

- Size the VSDP based on the maximum current requirements .
- Do not size the VSDP based on horsepower rating.
- Horsepower rating is based on standard NEMA B 4-pole motor design as represented In NEC table 430.250 full-load current, three-phase alternating Current Motors.
- Verify motor FLA for proper drive sizing and select drive with full load amps equal or greater than the motor FLA for pumping systems not continually operating in the motor service factor.
- For pumps operating in the service factor will require the VSD full load output amps to equal or exceed the motor service factor or maximum amp rating. (i.e., $1.15 \times \text{FLA} = \text{Required Drive FLA}$.) **Selecting the next larger size VSD might be required.**
- When sizing for submersible motors size the VSD based on the service factor or maximum amp rating of the motor as provided by the submersible motor manufacture. **Selecting the next larger size VSD might be required.**
- Refer to table VSDP-1 located on next page for output amp requirements for different pump types and if the pump is continually operating in the motor's service factor.
- Altitude Limits : No derating is necessary below 3,000 feet above sea level. Derate the drive output rating by 1% for every 300 feet of increase in elevation above 3,000 feet.

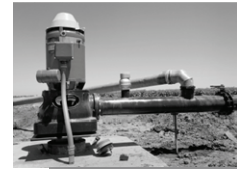


Table VSDP-1

Input Volts 3 P		MCI VSDP	Franklin Electric	Goulds CentriPro	US Motor VHS		North American VHS		NEMA 1800 RPM Std. Squirrel Cage Mtr	
	HP	Output Amps	Max. Amps	SF Amps	FLA	SFA	FLA	SFA 1.15	FLA	SFA 1.15
460	5	8.2	8.9	8.5					7.5	8.6
	7.5	11.0	13.2	13.5	9.0	10.4			11.0	12.7
	10	14.5	17.3	16.5	11.9	13.7	12.8	14.7	14.0	16.1
	15	21.0	23.7	23.0	18.4	21.2	18.5	21.3	21.0	24.2
	20	27.0	30.3	30.0	24.3	27.9	25.2	28.9	27.0	31.1
	25	34.0	37.5	37.0	32.0	36.8	30.4	34.9	34.0	39.1
	30	40.0	45.2	47.0	37.0	42.6	35.4	40.7	40.0	46.0
	40	52.0	61.6	60.0	51.0	58.7	47.5	54.6	52.0	59.8
	50	65.0	78.1	79.0	61.0	70.2	57.0	65.6	65.0	74.8
	60	80.0	92.3	90.0	71.0	81.7	70.5	81.1	77.0	88.6
	75	105.0	107.0	109.0	88.0	101.2	86.0	98.9	96.0	110.4
	100	130.0	142.0	145.0	119.0	136.9	112.0	128.7	124.0	142.6
	125	160.0	188.0	180.0	147.0	169.1	133.9	154.0	158.0	181.7
	150	190.0	219.0	220.0	177.0	203.6	166.3	191.2	180.0	207.0
	200	240.0	249.0	270.0	225.0	258.8	224.6	258.3	240.0	276.0
	250	303.0			283.0	325.5			302.0	347.3
	300	361.0			339.0	389.9			361.0	415.2
	350	443.0			389.0	447.4			414.0	476.1
	450	540.0			491.0	564.7			515.0	592.3
	500	590.0			554.0	637.1			590.0	678.5
230	2	7.5	8.1	7.6					6.8	7.8
	3	10.6	10.9	10.1					9.6	11.0
	5	16.7	17.8	17.5					15.2	17.5
	7.5	24.2	26.4	26.4	17.9	20.6			22.0	25.3
	10	30.8	32.2	33.0	23.9	27.5	25.6	29.5	28.0	32.2
	15	46.2	47.4	46.0	37.0	42.6	37.0	42.6	42.0	48.3
	20	59.4	30.3	60.0	49.0	56.4	50.3	57.9	54.0	62.1
	25	74.8	75.0	76.0	64.0	73.6	60.8	69.9	68.0	78.2
	30	88.0	90.4	94.0	73.0	84.0	70.8	81.4	80.0	92.0
	40	115.0			102.0	117.3	95.0	109.2	104.0	119.6
	50	143.0			122.0	140.3	114.0	131.1	130.0	149.5
	60	170.0			143.0	164.5	141.1	162.2	154.0	177.1



Extended Warranty



Coverage Terms

DrivePro-tection upgrades the product warranty by covering travel cost to the customer site and coverage of accidental damage to the product after installation, including the following:

- Momentary line or load anomalies such as lightning strikes
- Accidental collision after installation
- Temporary exposure to moisture or corrosives

Danfoss reserves the right to deny coverage for failures due to product vandalism, miss-application, shipping or installation damage, chronic destructive site conditions or site catastrophes such as floods or fires.



Coverage begins on the date of shipment and extends to the end of the contract period.

Pricing applies to drives installed in the 48 adjacent states, Oahu, Hawaii, Anchorage Alaska and Canada.

DrivePro

Professional Drive Support

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Extended Warranty—Pricing



DrivePro-tection - Onsite Drive Insurance Contract

HP Range (VT)			Total Coverage from Date of Shipment						
208VAC	460/600VAC	FRAME	1.5 year	2 year	3 year	4 year	5 year	6 year	
1-3	1.5-10	A	DTW118	DTW124	DTW136	DTW148	DTW160	DTW172	Ordering Number
			\$ 435	\$ 527	\$ 710	\$ 893	\$ 1,076	\$ 1,237	List Price
5-30	15-40	B	DTW218	DTW224	DTW236	DTW248	DTW260	DTW272	Ordering Number
			\$ 641	\$ 802	\$ 1,122	\$ 1,466	\$ 1,786	\$ 2,107	List Price
40-60	50-125	C	DTW318	DTW324	DTW336	DTW348	DTW360	DTW372	Ordering Number
			\$ 1,099	\$ 1,420	\$ 2,084	\$ 2,725	\$ 3,366	\$ 4,008	List Price
	150-350	D	DTW418	DTW424	DTW436	DTW448	DTW460	DTW472	Ordering Number
			\$ 1,878	\$ 2,473	\$ 3,664	\$ 4,855	\$ 6,046	\$ 7,236	List Price
	400-650	E	DTW518	DTW524	DTW536	DTW548	DTW560	DTW572	Ordering Number
			\$ 4,763	\$ 6,252	\$ 9,275	\$ 12,297	\$ 15,274	\$ 18,251	List Price

DrivePro

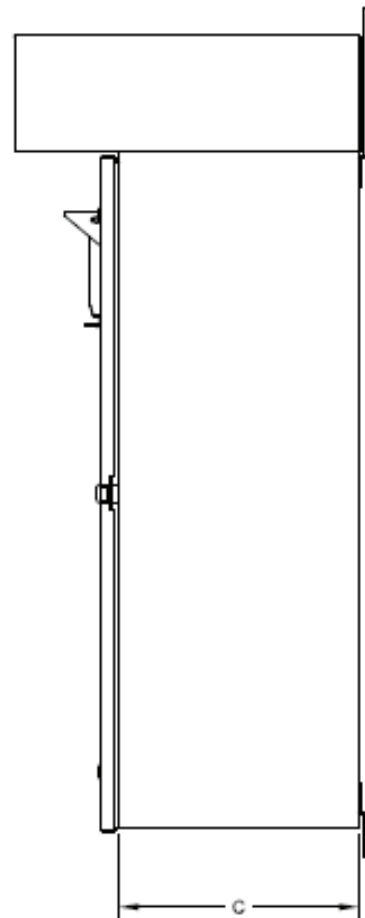
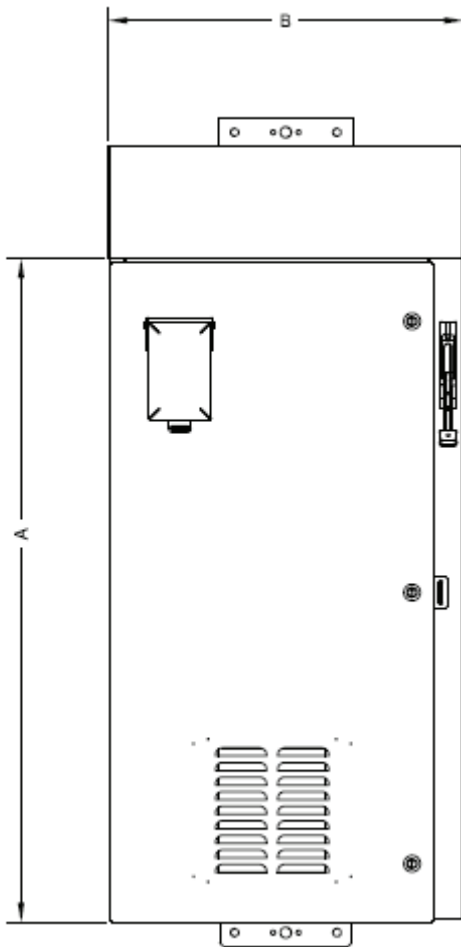
Professional Drive Support

Panel Sizes

VSD-N3R Pump Panel

PUMP PANEL ENCLOSURE DIMENSIONS

Height A (IN.)	Width B (IN.)	Depth C (IN.)
34	16	12
46	24	16
58	24	16



Panel Sizes

