

# HYDRAULIC CARTRIDGE VALVES

**SOLENOID OPERATED DIRECTIONAL CONTROLS**

**PROPORTIONAL CONTROLS**

**MOTORIZED CONTROLS**

**MECHANICAL DIRECTIONAL CONTROLS**

**MECHANICAL PRESSURE CONTROLS**

**MECHANICAL FLOW CONTROLS**

OCTOBER 2017



 **Delta Power Company** | **TECNORD**

GLOBAL DISTRIBUTION NETWORK

SOLENOID OPERATED DIRECTIONAL CONTROLS

2W2P NORMALLY CLOSED

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>new</b> UA-S2A	6	4000	23	276	Size 07
	PB-S2A	8	3500	30	241	Size 08
	HB-S2A	12	5000	45	345	Size 08
	DE-S2A	15	3500	57	241	Size 10
	HE-S2A	15	4000	57	276	Size 10
	TT-S2A	25	3000	95	207	Size 12
	SJ-S2A	30	3500	114	241	Size 16
	HJ-S2A	40	4350	151	300	Size 16
	PB-S2B	8	3500	30	241	Size 08
	HB-S2B	12	5000	45	345	Size 08
	DE-S2B	15	3500	57	241	Size 10
	HE-S2B	15	4000	57	276	Size 10
	TT-S2B	25	3000	95	207	Size 12
	HT-S2B	25	5000	95	345	Size 12
	SJ-S2B	30	3500	114	241	Size 16
	<b>new</b> UA-S2F	4	3000	15	207	Size 07
	PB-S2F	6	2500	23	172	Size 08
	DE-S2F	10	1000	38	69	Size 10
	<b>new</b> UA-S2E	0.20	4000	0.76	276	Size 07
	PB-S2I	4	3600	15	250	Size 08
	DE-S2I	3	3000	11	207	Size 10
	HB-S2L	12	5000	45	345	Size 08
	<b>new</b> UA-S2G	1.5	4000	6	276	Size 07
	PB-S2G	8	3000	30	207	Size 08
	DE-S2G	8	3000	30	207	Size 10
	HE-S2G	15	4000	57	276	Size 10

2W2P NORMALLY OPEN

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	PB-S2C	10	3500	38	241	Size 08
	HB-S2C	12	5000	45	345	Size 08
	DE-S2C	15	3500	57	241	Size 10
	TT-S2C	30	3000	114	207	Size 12
	SJ-S2C	40	3000	151	207	Size 16
	HJ-S2C	40	4350	151	300	Size 16
	PB-S2D	10	3500	38	241	Size 08
	HB-S2D	12	5000	45	345	Size 08
	DE-S2D	15	3500	57	241	Size 10
	TT-S2D	30	3000	114	207	Size 12
	SJ-S2D	40	3000	151	207	Size 16
	PB-S2J	8	2000	30	138	Size 08
	HB-S2K	12	5000	45	345	Size 08
	<b>new</b> UA-S2H	1	4000	4	276	Size 07
	PB-S2H	5	3000	19	207	Size 08
	DE-S2H	8	3500	30	241	Size 10
	HE-S2H	8	4000	30	276	Size 10



SOLENOID OPERATED DIRECTIONAL CONTROLS

3W2P SPOOL

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>new</b> UC-S3A	1	4000	4	276	Size 07
	PP-S3A	3	3000	11	207	Size 08
	DF-S3A	10	3000	38	207	Size 10
	HF-S3A	10	4500	38	315	Size 10
	PP-S3B	2.5	3000	9.5	207	Size 08
	DF-S3B	8	3000	30	207	Size 10
	HF-S3B	8	4000	30	276	Size 10
	HU-S3E	15	5000	57	345	Size 12
	HU-S3F	15	5000	57	345	Size 12
	PP-S3X	3	3000	11	207	Size 08
	PP-S3D	3	3000	11	207	Size 08

4W3P SPOOL

	VQ-S4M	3	3000	11	207	Size 08
	PQ-S4M	5	3000	19	207	Size 08
	DG-S4M	6.5	3000	25	207	Size 10
	PQ-S4N	5	3000	19	207	Size 08
	DG-S4N	6	3000	23	207	Size 10
	VQ-S4R	2.5	3000	9.5	207	Size 08
	PQ-S4R	3	3000	11	207	Size 08
	PQ-S4O	3	3000	11	207	Size 08
	DG-S4O	8	3000	30	207	Size 10
	PQ-S4T	5	3000	19	207	Size 08
	PQ-S4P	5	3000	19	207	Size 08
	DG-S4P	8	3000	30	207	Size 10
	VQ-S4Q	3.5	3000	13	207	Size 08
	PQ-S4Q	6	3000	23	207	Size 08
	DG-S4S	6	3000	23	207	Size 10

4W2P SPOOL

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>new</b> UD-S4A	1	4000	4	276	Size 07
	PQ-S4A	4	3000	15	207	Size 08
	DG-S4A	10	3500	38	241	Size 10
	HG-S4A	10	4000	38	276	Size 10
	HV-S4A	15	5000	57	345	Size 12
	<b>new</b> UD-S4B	1.5	4000	6	276	Size 07
	PQ-S4B	4	3000	15	207	Size 08
	DG-S4B	10	3000	38	207	Size 10
	HG-S4B	10	4000	38	276	Size 10
	PQ-S4C	4	3000	15	207	Size 08
	DG-S4C	8	3000	30	207	Size 10
	HG-S4C	8	4000	30	276	Size 10
	PQ-S4D	2.5	3000	9.5	207	Size 08
	DG-S4D	6	3000	23	207	Size 10
	HG-S4D	8	4000	30	276	Size 10
	DG-S4E	6	3000	23	207	Size 10
	HG-S4E	8	4000	30	276	Size 10
	HV-S4E	15	5000	57	345	Size 12
	DG-S4F	6	3000	23	207	Size 10
	HG-S4F	6	4000	23	276	Size 10

TRANSMISSION & BRAKE

	IE-S2H-56	6	1000	23	70	T056 slip-in
	TC-S3A	3	1000	11	70	Size 07
	TF-S3A	6	1000	23	70	Size 10
	IF-S3A-57	6	1000	23	70	T057 slip-in
	UC-S3T	3	1500	11	103	Size 07
	DF-S3T	8	1500	30	103	Size 10
	IC-S3D-43	1.5	700	6	50	T043 slip-in
	TF-S3D	6	1000	23	70	Size 10
	IF-S3D-57	6	1000	23	70	T057 slip-in
	TG-S4A	5	1000	19	70	Size 10
	IG-S4A-58	5	1000	19	70	T058 slip-in

**PROPORTIONAL PRESSURE REDUCING/RELIEVING VALVES**

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>IP-DAR-250</b>	1	700	4	50	T250 slip-in
	<b>IP-DAR-43C</b>	1	700 5000	4	50 345	T043 slip-in
	<b>IP-RDS-222</b>	8	870	30	60	T222 slip-in
	<b>EG-RDS-42</b>	5	3000	20	207	Size 10
	<b>EC-PRV</b>	2	500	8	35	Size 07
	<b>EF-PRP</b>	15	3000	57	207	Size 10
	<b>IP-PRZ-59</b>	7.9	700	30	50	T059 slip-in
	<b>EG-TRZ-42</b>	7.9	700 3500	30	50 241	Size 10
	<b>EG-PRZ</b>	8	450	30	31	Size 10
	<b>ES-PRZ</b>	7.9	3500	30	241	Size 16

**PROPORTIONAL PRESSURE RELIEF VALVES**

	<b>EE-PRB</b>	20	3000	76	207	Size 10
	<b>EE-PRD</b>	20	3000	76	207	Size 10

**2 WAY NORMALLY CLOSED PROPORTIONAL FLOW CONTROL VALVES**

	<b>EE-P2G</b>	13.2	3500	50	241	Size 10
	<b>ET-P2S</b>	23.7	3500	90	241	Size 12
	<b>EB-P2A</b>	6.5	3500	25	241	Size 08
	<b>EE-P2A</b>	12	3500	45	241	Size 10
	<b>ET-P2A</b>	29	3500	110	241	Size 12

**2 WAY NORMALLY OPEN PROPORTIONAL FLOW CONTROL VALVES**

	<b>EE-P2H</b>	8	3500	30	241	Size 10
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**2 WAY NORMALLY CLOSED PRESSURE COMPENSATED PROPORTIONAL FLOW REGULATOR VALVES**

	<b>EG-F2A</b>	12	3500	45	241	Size 10
	<b>EU-F2A</b>	26	3500	100	241	Size 12

**3 WAY NORMALLY CLOSED PRESSURE COMPENSATED**

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>EF-F3G</b>	6	3500	23	241	Size 10
	<b>EU-F3G</b>	16	3500	60	241	Size 12

**4W3P PROPORTIONAL DIRECTIONAL CONTROL VALVES**

	<b>EQ-S4M</b>	3	3500	11	241	Size 08
	<b>EG-S4M</b>	6	3500	23	241	Size 10
	<b>EQ-S4P</b>	3	3500	11	241	Size 08
	<b>EG-S4P</b>	6	3500	23	241	Size 10

**MOTORIZED FLOW RESTRICTORS (NEEDLE VALVES)**

	<b>AE-NVA</b>	10	3500	38	241	Size 08
	<b>AJ-NVA</b>	40	3500	150	241	Size 16

**MOTORIZED 2W PRESSURE COMPENSATED FLOW REGULATORS**

	<b>AJ-FCA</b>	25	3500	95	241	Size 16
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**MOTORIZED 3W PRESSURE COMPENSATED FLOW REGULATORS**

	<b>AK-FCQ</b>	25	3500	95	241	Size 16
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**MOTORIZED RELIEF VALVES**

	<b>AJ-RVR</b>	37	3500	140	241	Size 16
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**MOTORIZED PRESSURE REDUCING VALVES**

	<b>AF-PRP</b>	10	3000	38	207	Size 10
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**DIRECT ACTING CHECK VALVES**

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>IM-CVA</b>	8	3000	30	207	In line
	<b>MA-CVA</b>	5	3500	19	241	Size 07
	<b>HB-CVA</b>	10	4350	38	300	Size 08
	<b>DE-CVA</b>	15	3500	57	241	Size 10
	<b>HE-CVA</b>	15	5000	57	345	Size 10
	<b>HT-CVA</b>	35	5000	132	345	Size 12
	<b>SJ-CVA</b>	40	3500	151	241	Size 16
	<b>DE-CVB</b>	10	3500	38	241	Size 10
	<b>PB-CVC</b>	10	3500	38	241	Size 08
	<b>DE-CVC</b>	8	3500	30	241	Size 10
	<b>DE-CVR</b>	15	3500	57	241	Size 10
	<b>HT-CVR</b>	35	5000	132	345	Size 12
	<b>MA-CVS</b>	2.5	1500	9.5	103	Size 07
	<b>PB-CVS</b>	5	3500	19	241	Size 08
	<b>DE-CVS</b>	10	1000	38	70	Size 10

**PILOT TO OPEN and DOUBLE PO CHECK VALVES**

	<b>PP-CPB</b>	6	3500	23	241	Size 08
	<b>DF-CPB</b>	8	3500	30	241	Size 10
	<b>DF-CPC</b>	10	3500	38	241	Size 10
	<b>PQ-CDP</b>	5	3000	19	207	Size 08
	<b>DG-CDP</b>	8	3000	30	207	Size 10

**PILOT TO CLOSE CHECK VALVES**

	<b>DF-CPD</b>	10	3500	38	241	Size 10
	<b>SL-CPD</b>	20	3500	76	241	Size 16

**CHECK VALVES WITH THERMAL RELIEF**

	<b>DE-CVT</b>	15	4000	57	276	Size 10
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**LOAD HOLDING VALVES**

	<b>QS-CBS</b>	15	4000	57	276	In line
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**SHUTTLE VALVES**

	<b>IM-CSB</b>	10	3500	38	241	In line
	<b>PP-CSB</b>	6	3500	23	241	Size 08
	<b>DF-CSB</b>	8	3500	30	241	Size 10

**2 WAY 2 POSITION MANUAL VALVES**

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	<b>PB-MCA</b>	12	3500	45	241	Size 08
	<b>DE-MCA</b>	15	3500	57	241	Size 10
	<b>DE-MCF</b>	20	1500	76	103	Size 10
	<b>DE-MCS</b>	20	3500	76	241	Size 10
	<b>DE-MCB</b>	20	3500	76	241	Size 10
	<b>PB-MCI</b>	8	3500	30	241	Size 08
	<b>PB-MCL</b>	8	3500	30	241	Size 08
	<b>DE-MCL</b>	15	3500	57	241	Size 10
	<b>DE-M2G</b>	20	3000	76	207	Size 10
	<b>HB-MCP</b>	1	4000	4	276	Size 08

**MANUAL ROTARY VALVES**

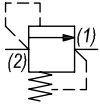
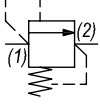
	<b>SJ-MRA</b>	40	3000	151	207	Size 16
	<b>DF-M3A</b>	12	3000	45	207	Size 10
	<b>DG-M4A</b>	10	3000	38	207	Size 10
	<b>DG-M4B</b>	15	3000	57	207	Size 10
	<b>DG-M4C</b>	12	3000	45	207	Size 10
	<b>QS-MRS</b>	25	3000	95	207	In line

**PILOT TO SHIFT VALVES**

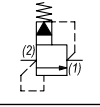
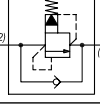
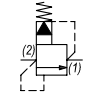
	<b>HG-PDA</b>	10	4000	38	276	Size 10
	<b>HG-PDC</b>	10	4000	38	276	Size 10
	<b>HG-PDI</b>	10	3000	38	207	Size 10
	<b>HG-PDO</b>	10	4000	38	276	Size 10
	<b>HF-PDE</b>	10	4000	38	276	Size 10
	<b>HF-PDI</b>	10	3000	38	207	Size 10
	<b>SO-PTS</b>	40	3500	151	241	Size 16
	<b>SO-PTT</b>	40	3500	151	241	Size 16



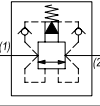
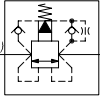
## DIRECT ACTING AND DIFFERENTIAL AREA RELIEF VALVES

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	DE-RCA	12	3500	45	241	Size 10
	MA-RVA	5	3000	19	207	Size 07
	PB-RVA PB-RWA	6	3500	23	241	Size 08
	DE-RVA DE-RWA	8	4000	30	276	Size 10
	DE-RCD	15	3500	57	241	Size 10
	PB-RVD PB-RWD	8	3500	30	241	Size 08
	DE-RVD DE-RWD	15	4000	57	276	Size 10
	HE-RVD	40	5000	151	345	Size 10

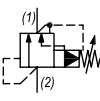
## PILOT OPERATED RELIEF VALVES

	DE-RVP	20	4000	76	276	Size 10
	DE-RWP	15		57		
	HT-RVP	20	5000	76	345	Size 12
	DE-RVR DE-RWR	15	4000	57	276	Size 10
	SJ-RVR	40	3500	151	241	Size 16
	HE-RWP	40	5000	151	345	Size 10

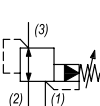
## CROSSOVER RELIEF VALVES

	DE-RVB	15	4000	57	276	Size 10
	DE-RVC	15	4000	57	276	Size 10

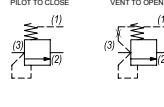
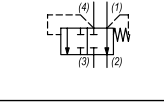
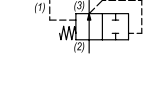
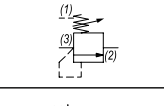
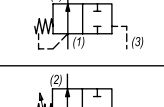
## SHUT DOWN VALVES

	DE-PSD	15	4500	57	310	Size 10
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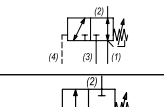
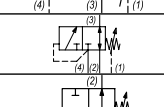
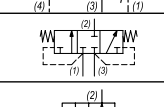
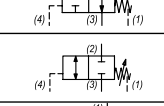
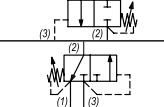
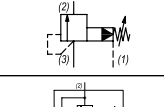
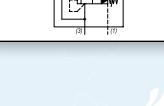

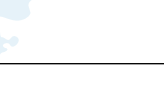
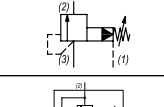
## PRESSURE REDUCING/RELIEVING VALVES

	DF-PRP	10	3000	38	207	Size 10
	SK-PRP	20	3000	76	207	Size 16
	DF-PWP	10	4000	38	276	Size 10

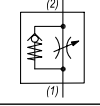
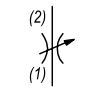
## PRESSURE COMPENSATED REGULATOR VALVES

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	DF-PCR	10	3500	38	241	Size 10
	QC-CP3	33	3500	120	241	T031
	TR-PCA	40	3500	151	241	Size 12
	SL-PCA	40	3500	151	241	Size 16
	DG-PCB	10	3500	38	241	Size 10
	DG-TCB	10	3500	38	241	Size 10
	SL-PCB	40	3500	151	241	Size 16
	PP-PCC	8	3000	30	207	Size 08
	DF-CP2	8	3500	30	241	Size 10
	TR-PCC	20	3500	76	241	Size 12
	QC-CP2	19	3500	70	241	T031
	DF-PCE	10	3500	38	241	Size 10
	SL-PCE	40	3500	151	241	Size 16
	DF-PCS	10	3500	38	241	Size 10
	DF-TCS	10	3500	38	241	Size 10
	DF-PCT	10	3500	38	241	Size 10

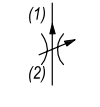
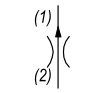
## SEQUENCE VALVES

	DG-PSA	10	3000	38	207	Size 10
	DG-PSC	10	3000	38	207	Size 10
	DG-PSI	10	3000	38	207	Size 10
	DG-PSO	10	3000	38	207	Size 10
	DG-PSS	12	3000	45	207	Size 10
	DG-PTC	10	3000	38	207	Size 10
	DG-PTO	10	3000	38	207	Size 10
	DF-PWE	10	3000	38	207	Size 10
	DF-PWI	8	3000	30	207	Size 10
	SL-PWA	40	3500	151	241	Size 16
	SL-PWB	40	3500	151	241	Size 16

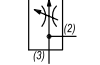
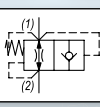
## NEEDLE VALVES - FLOW RESTRICTORS

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	DE-FCH	12	3500	45	241	Size 10
	MA-NVA	6	3500	23	241	Size 07
	PB-NVA	6	3500	23	241	Size 08
	DE-NVA	10	3500	38	241	Size 10
	HT-NVA	35	5000	132	345	Size 12
	SJ-NVA	40	3500	151	241	Size 16
	PB-NVB	3	3500	11	241	Size 08
	DE-NVB	15	3500	57	241	Size 10

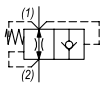
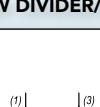
## PRESSURE COMPENSATED FLOW REGULATOR VALVES

	MA-FCA	3	3000	11	207	Size 07
	PB-FCA	4	3500	15	241	Size 08
	DE-FCA DE-FCC	8	3500	30	241	Size 10
	HT-FCA	18	5000	68	345	Size 12
	SJ-FCA	25	3500	95	241	Size 16
	DE-FCB DE-FCF	8	3500	30	241	Size 10
	SJ-FCF	25	3500	95	241	Size 16

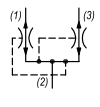
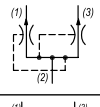
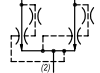
## PRIORITY FLOW REGULATOR VALVES

	DF-FCP	10	3000	38	207	Size 10
	SK-FCP	25	3000	95	207	Size 16
	DF-FCQ	10	3000	38	207	Size 10
	SK-FCQ	25	3000	95	207	Size 16

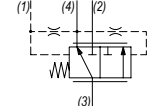
## VELOCITY FUSES

	IM-CVF	6	3500	23	241	In line
	DE-CVF	10	3500	38	241	Size 10

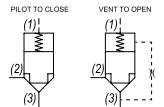
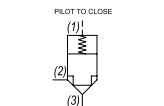
## FLOW DIVIDER/COMBINER VALVES

	DG-FDA	12	3500	45	241	Size 10
	DG-FDH HIGH ACCURACY	12	3500	45	241	Size 10
	SN-FDA	40	3500	151	241	Size 16
	DG-FDB	12	3500	45	241	Size 10
	DG-FDT	12	3500	45	241	Size 10

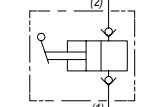
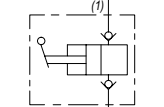
## STEERING PRIORITY FLOW CONTROL

Schematic	Model	GPM	PSI	LPM	BAR	Cavity*
	SO-PDS	20	3000	76	207	Size 16

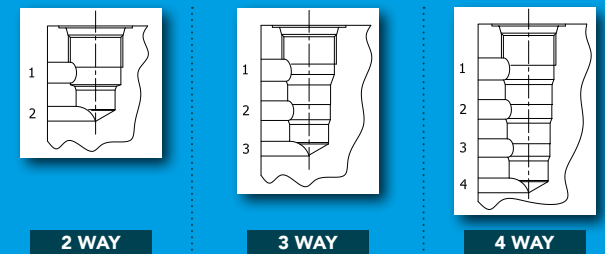
## LOGIC ELEMENTS

	SL-PLA	40	3500	151	241	Size 16
	SL-PLB	40	3500	151	241	Size 16
	SL-PLC	40	3500	151	241	Size 16

## HAND PUMPS

	DE-HPA PUSH TO PUMP	0.35 cu in/stroke	500	5.8 cc/stroke	34	Size 10
	DE-HPB PUSH TO PUMP	0.39 cu in/stroke	2000	6.4 cc/stroke	138	Size 10
	DE-HPE PULL TO PUMP	0.39 cu in/stroke	2000	6.4 cc/stroke	138	Size 10
	DE-HPC PUSH TO PUMP	0.35 cu in/stroke	500	5.8 cc/stroke	34	Size 10
	DE-HPD PUSH TO PUMP	0.39 cu in/stroke	2000	6.4 cc/stroke	138	Size 10
	DE-HPF PULL TO PUMP	0.39 cu in/stroke	2000	6.4 cc/stroke	138	Size 10

## \* CAVITY CONVENTION



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