

Hydraulic and Electronic Components

Product Information





He who knows the goal can decide;
He who decides, finds tranquillity;
He who finds tranquillity is safe;
He who is safe can consider;
He who can consider, can improve.

Anon



Welcome to the World of Bucher Hydraulics...

For several decades, we have been a leading supplier of innovative solutions in hydraulic drive and control technology.

With our wide technical expertise, we will smooth your way through your projects from idea to finished product.

We can offer you the support you need at any stage of your technically challenging projects, whether it be in the concept phase, when setting the specification or at the start of volume production of your high quality and often future-oriented vehicles and machines.

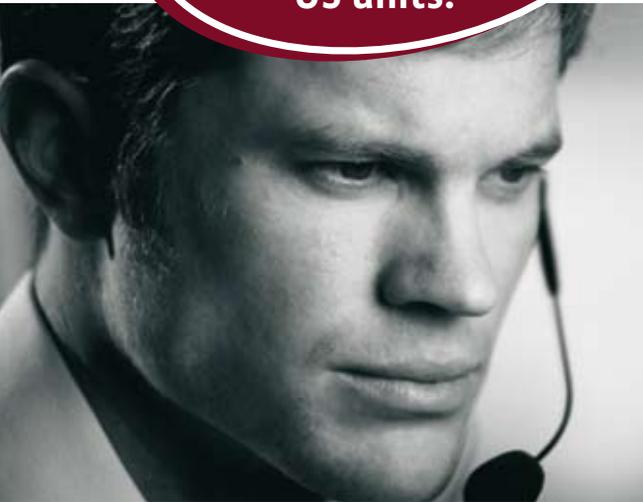
The product overview in the next pages should give you an initial impression of our product range.

Furthermore, we can offer you a variety of possible solutions for your individual requirements. Our sales representatives and distributors look forward to working together with you to find the best solutions to meet your needs.

You can find your personal contacts on our website:

www.bucherhydraulics.com

Please note
that the figures in
the blue boxes are
US units.



Contents

Summary

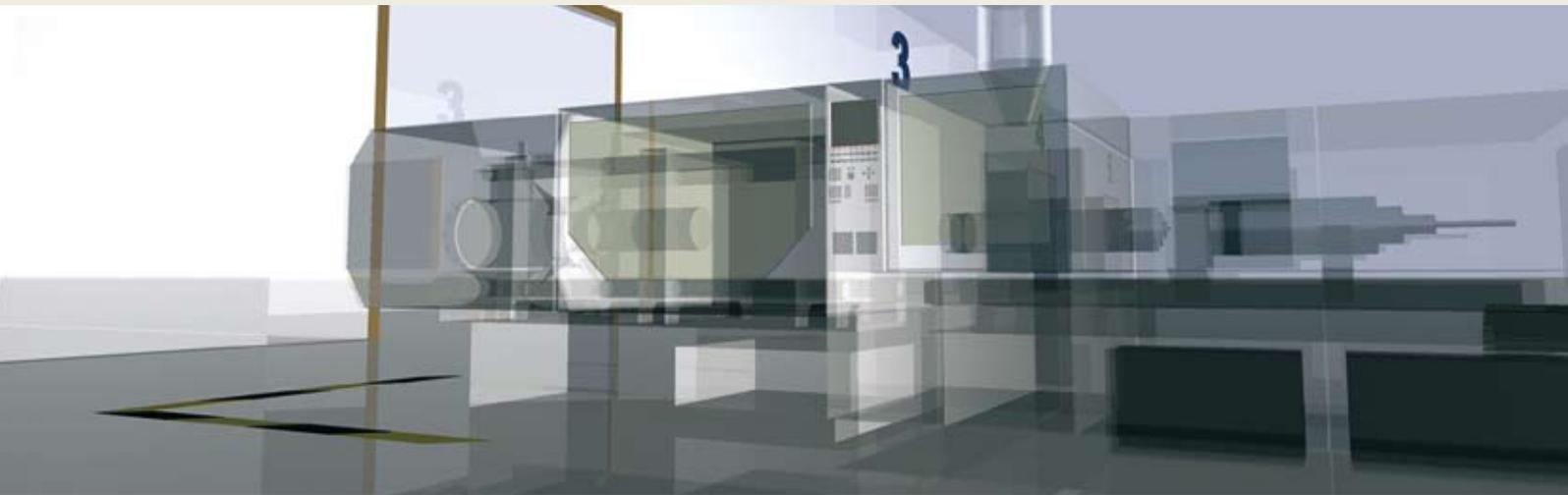
Products	Series					Page
Pumps						
		bar	cm³/rev	psi	in³/rev	
Internal Gear Pumps	QX	320	3 - 500	4600	0.2 - 30	8
Internal Gear Pumps for Low Viscosity fluids	QXV	250	5 - 500	3600	0.3 - 30	9
Internal Gear Pumps	QXP	250	3 - 500	3600	0.2 - 30	10
External Gear Pumps	AP	220	0.25 - 93	3100	0.02 - 5.8	11
Motors						
		bar	cm³/rev	psi	in³/rev	
Internal Gear Drive Units	QXM	320	5 - 500	4600	0.3 - 30	14
Internal Gear Motors	QXMHS	240	20 - 32	3400	1.2 - 2	15
Internal Gear Flow Dividers	QXT	250	5 - 250	3600	0.3 - 15	16
External Gear Motors	APM	220	0.5 - 26	3100	0.03 - 1.5	18
Gerotor Motors	B	210	50 - 2100	3000	3.1 - 130	19
Power Units						
		bar	cm³/rev	psi	in³/rev	
Hydraulic Power Packs	UP, M-series	230	0.25 - 10	3300	0.02 - 0.6	22
Electro-hydraulic Pumps	ET	230	0.25 - 10	3300	0.02 - 0.6	23
Directional Spool Valves						
		bar	l/min	psi	gpm	
Monobloc Construction:						
• Manually Operated and Solenoid On/Off	HDM	350	40 - 70	5000	11 - 19	26
• Electric, Hydraulic, Manual and Combined	MV	350	50 - 450	5000	13 - 119	27
Manifold Mounting:						
• Electric, Hydraulic, Manual and Combined	CV	350	50 - 450	5000	13 - 119	28
• Solenoid Directional Valves (CETOP)	W	315	25 - 160	4500	6.6 - 42	29
Sectional Construction:						
• Manually Operated, Solenoid On/Off and Solenoid Proportional	HDS	250	25 - 120	3600	6.6 - 32	30
• Manually Operated, Hydraulic, Solenoid On/Off, Proportional, Electrically Operated Two-stage	L.8S	315	150	4500	40	31
• Hydraulic, Solenoid On/Off, Proportional, Electrically Operated Two-stage, On Board Electronic	LVS	350	260	5000	69	32
• Electric, Hydraulic, Manual and Combined	SV	350	180 - 330	5000	48 - 87	33
• Electric, Hydraulic and Combined	LV	350	95 - 500	5000	25 - 132	34

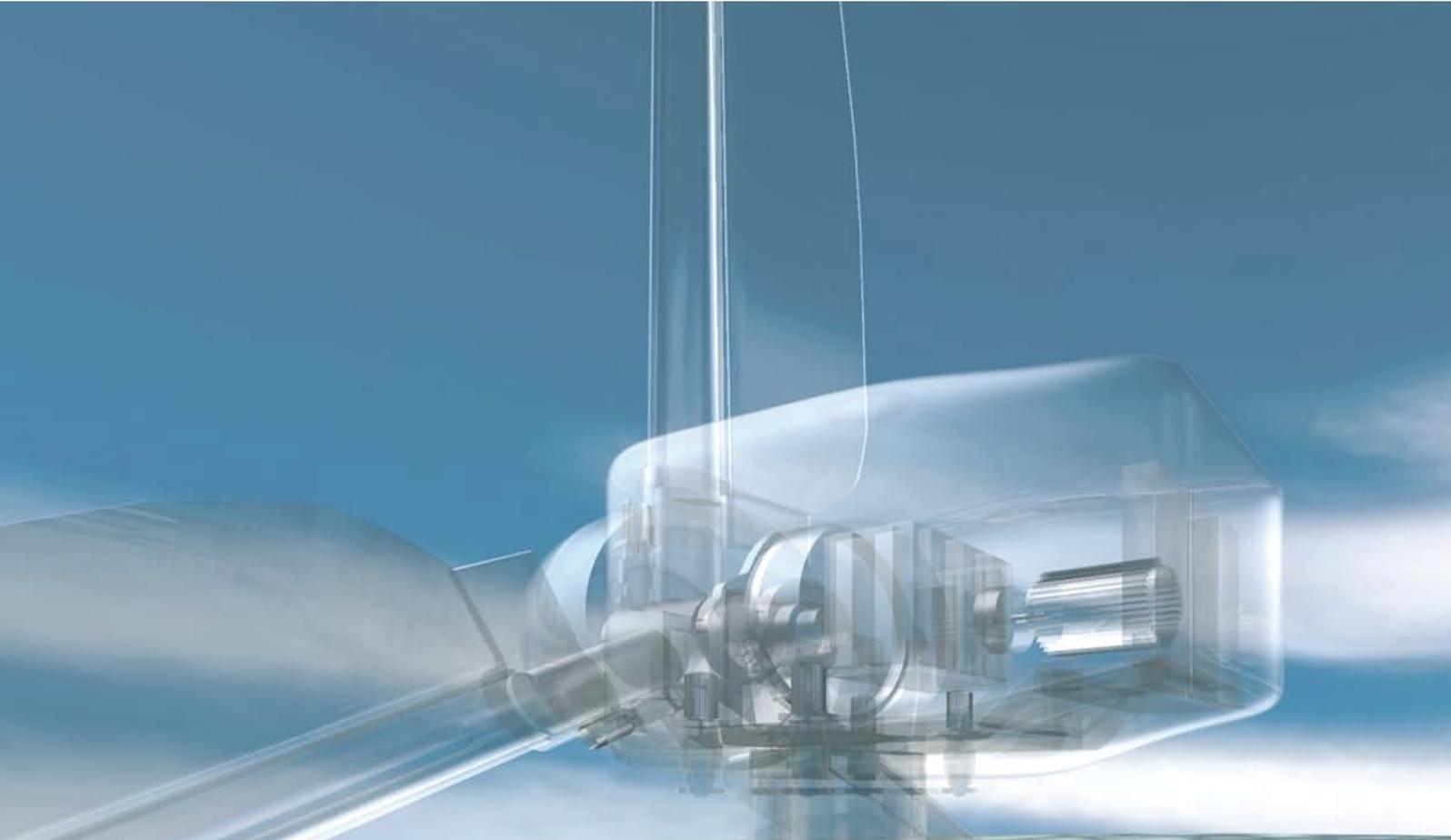
Product	Series					Page
Cartridge Valves		bar	l/min	psi	gpm	
Solenoid Directional Valves	W	420	350	6000	92	38
Pressure Valves	D	450	350	6400	92	39
Solenoid Pressure Valves	D	420	350	6000	92	40
Flow-control Valves	M	420	250	6000	66	41
Check Valves	R	350	360	5000	95	42/43
Stack Valves		bar	l/min	psi	gpm	
Solenoid Directional Valves	SW	350	300	5000	79	46
Pressure Valves	SD	350	300	5000	79	47
Check Valves	SR	350	300	5000	79	48
Flow-control Valves	SM	350	260	5000	69	49
Check Valves for SAE Flange Connections	RVSAE	420	1200	6000	317	50
Safety Valves		bar	l/min	psi	gpm	
Special Valves	-	450	20 - 300	6400	5.3 - 79	54
Leak-free Load Control Valves	CINDY	420	150 - 500	6000	40 - 132	55
Leak-free Load Control Valves	CLC	350	120	5000	32	56
Load Control Valve	REFUVA	420	300	6000	79	57
Pipe Rupture Valve for Excavators	ESV + CFS	420	250 - 500	6000	66 - 132	58
Pipe Rupture Valve	RS	400	40 - 400	5700	11 - 105	59
EEx Protected Valves		bar	l/min	psi	gpm	
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Monobloc and Sectional Valves	SVH04	210	20	3000	5.3	66
Monobloc Valves	WSH03	250	25	3600	6.6	67
Flow-control Valves		bar	l/min	psi	gpm	
Flow Dividers	MTDA	315/420	2 - 250	4500/6000	0.5 - 66	70
Flow-Control Valves:						
• Manually Adjustable and Fixed Adjustment	MT	315	80	4500	21	71
• Proportional Solenoid Adjustment	SR	315	6 - 100	4500	1.6 - 26	72
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System Solutions		bar	cm³/rev	psi	in³/rev	
System Solutions (Subsystems)		420	-	6000	-	82
Fan Controls		250	4.3 - 63	3600	0.3 - 48	83

■ Pumps

Hydraulic pumps from Bucher Hydraulics are available in both internal gear and external gear designs, suitable for medium and high pressure applications.

They are powerful yet compact, reliable yet cost effective, and together with their high efficiency, long service life and fine size increments, these are key reasons for using these pumps.





■ Internal Gear Pumps

Quiet, powerful and long-lasting

■ Internal Gear Pumps

For low-viscosity fluids

■ Internal Gear Pumps

For polyurethane production

■ External Gear Pumps

Compact and robust

Quiet, powerful and long-lasting

QX Internal Gear Pumps



Features

- Fixed displacement pump
- For open loop systems
- Displacement: 3 – 500 cm³/rev
(0.2 - 30 in³/rev)
- Maximum continuous pressure:

Pressure range 1	100 - 160 bar (1400 - 2300 psi)
Pressure range 2	210 bar (3000 psi)
Pressure range 3	320 bar (4600 psi)
- Maximum intermittent pressure:

Pressure range 1	125 - 210 bar (1800 - 3000 psi)
Pressure range 2	250 bar (3600 psi)
Pressure range 3	400 bar (5700 psi)

Advantages

- Service life >20,000 hours
- Sound pressure level <57 dB(A)
- Volumetric efficiency up to 98%
- Trouble-free operation with fire-resistant fluid such as HFB, HFC and HFD
- Suitable for use with variable speed drives

Size		2	3	4	5	6	8
Displacement	cm ³ /rev	3.5 – 16	10.5 – 25.5	20.5 – 65	39.5 – 127.5	80.5 – 160.5	163 – 498.5
Flow rate at 1450 r/min	l/min	5 – 23	14.5 – 45.5	29.5 – 94	47 – 184	116 – 362	236 – 722
Max. speed	r/min	3600	3400	3200	3000	2300	1800
Power requirement	kW	2.5 – 6	5 – 12	10.5 – 25	20 – 49.5	40.5 – 96.5	83 – 193
Torque	Nm	17 – 41	34 – 80	68 – 165	132 – 321	268 – 636	544 – 1270

Size		2	3	4	5	6	8
Displacement	in ³ /rev	0.2 - 1.0	0.6 - 1.6	1.3 - 4.0	2.4 - 7.8	4.9 - 9.8	9.9 - 30
Flow rate at 1450 r/min	gpm	1.3 - 6	4 - 12	8 - 25	12.5 - 48.5	30.5 - 95.5	62.5 - 190.5
Max. speed	r/min	3600	3400	3200	3000	2300	1800
Power requirement	kW	2.5 – 6	5 – 12	10.5 – 25	20 – 49.5	40.5 – 96.5	83 – 193
Torque	lbf ft	13 - 30	25 - 60	50 - 120	95 - 235	200 - 470	401 - 935

For low-viscosity fluids

QXV Internal Gear Pumps



Features

- Fixed displacement pump
- For open loop systems
- Displacement: 5 – 500 cm³/rev
(0.3 - 30 in³/rev)
- Viscosity range:
0.8 – 10 mm²/s (cSt)
- Maximum continuous pressure:
 Pressure range 1 25 bar (350 psi)
 Pressure range 2 50 bar (700 psi)
 Pressure range 3 100 bar (1400 psi)
 Pressure range 4 150 bar (2100 psi)
 Pressure range 5 200 bar (2900 psi)
 Pressure range 6 250 bar (3600 psi)

Advantages

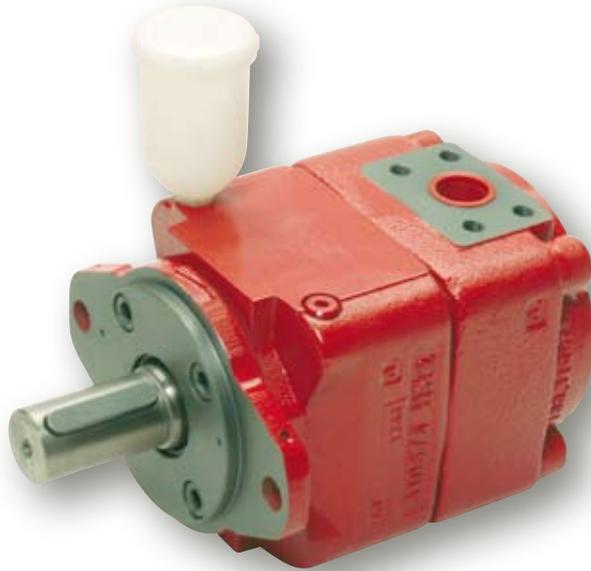
- High operating safety
- Consistent flow rate
- Trouble-free operation with kerosene, diesel fuel, brake fluid, Pentosin and HFA
- Long life and low wear due to hydrodynamic bearings

Size		2	3	4	5	6	8
Displacement	cm ³ /rev	5 – 16	10.5 – 25.5	20.5 – 65	39.5 – 127.5	80 – 160.5	163 – 498.5
Flow rate at 1450 r/min	l/min	7.5 - 23	14.5 – 45	29.5 – 94	57 - 184	116 - 362	236 - 722
Max. speed	r/min	3600	3600	3600	3000	1800	1800

Size		2	3	4	5	6	8
Displacement	in ³ /rev	0.3 - 1.0	0.6 - 1.6	1.3 - 4.0	2.4 - 7.8	4.9 - 9.8	9.9 - 30
Flow rate at 1450 r/min	gpm	2 - 6	4 - 12	8 - 25	12.5 - 48.5	30.5 - 95.5	62.5 - 190.5
Max. speed	r/min	3600	3600	3600	3000	1800	1800

For polyurethane production

QXP Internal Gear Pumps



Features

- Metering pump
- Displacement: 3 – 500 cm³/rev
(0.2 - 30 in³/rev)
- Viscosity range:
10 – 300 mm²/s (cSt) Standard
3 – 20.000 mm²/s (cSt) on request
- Maximum continuous pressure:
Pressure range 1 100 bar (1400 psi)
Pressure range 2 210 bar (3000 psi)
Pressure range 3 250 bar (3600 psi)

Advantages

- Highly accurate metering
- Low pulsation
- Variable speed operation
- For use with polyol, isocyanates and additives
- Extremely high operating safety

Size		2	3	4	5	6	8
Displacement	cm ³ /rev	3.5 - 15	10.5 - 25.5	20.5 - 65	39.5 - 127.5	80 - 160.5	163 - 498.5
Flow rate at 1450 r/min	l/min	5 - 23	14.5 - 45	29.5 - 94	57 - 184	116 - 362	236 - 722
Max. speed	r/min	3600	3400	3200	3000	2300	1800
Power requirement at cont. pressure	kW	2.5 - 5.5	5 - 10	10.5 - 21	20 - 41	40.5 - 81.5	83 - 162
Torque at continuous pressure	Nm	17 - 41	34 - 80	68 - 165	132 - 321	268 - 636	544 - 1270

Size		2	3	4	5	6	8
Displacement	in ³ /rev	0.2 - 1	0.6 - 1.6	1.3 - 4.0	2.4 - 7.8	4.9 - 9.8	9.9 - 30
Flow rate at 1450 r/min	gpm	1.3 - 6	4 - 12	8 - 25	12.5 - 48.5	30.5 - 95.5	62.5 - 190.5
Max. speed	r/min	3600	3400	3200	3000	2300	1800
Power requirement at cont. pressure	kW	2.5 - 5.5	5 - 10	10.5 - 21	20 - 41	40.5 - 81.5	83 - 162
Torque at continuous pressure	lbf ft	13 - 30	25 - 60	50 - 120	95 - 235	195 - 470	400 - 935

Compact and robust

AP External Gear Pumps



Features

- Fixed displacement pump
- For open and closed loop systems
- Displacement:
0.25 - 93 cm³/rev (0.02 - 5.8 in³/rev)
- Maximum continuous pressure:

AP05	190 bar	(2700 psi)
APR05	170 bar	(2400 psi)
AP100	210 bar	(3000 psi)
AP200	220 bar	(3100 psi)
AP300	220 bar	(3100 psi)

Advantages

- Axial pressure compensated
- Double pumps
- Versions with integrated valves available

Size		AP05	APR05	AP100	AP200	AP300
Displacement	cm ³ /rev	0.25 - 1.6	0.25 - 1.2	1.2 - 10	4.3 - 26	27 - 93
Max. continuous pressure	bar	170 - 190	150 - 170	150 - 210	190 - 220	150 - 220
Max. intermittent pressure	bar	180 - 210	160 - 190	180 - 250	210 - 250	170 - 250
Speed range	r/min	550 - 7000	550 - 7000	500 - 5000	600 - 4000	500 - 3500

Size		AP05	APR05	AP100	AP200	AP300
Displacement	in ³ /rev	0.02 - 0.1	0.02 - 0.07	0.07 - 0.6	0.3 - 1.6	1.6 - 5.7
Max. continuous pressure	psi	2400 - 2700	2100 - 2400	2100 - 3000	2700 - 3100	2100 - 3100
Max. intermittent pressure	psi	2600 - 3000	2300 - 2700	2600 - 3600	3000 - 3600	2400 - 3600
Speed range	r/min	550 - 7000	550 - 7000	500 - 5000	600 - 4000	500 - 3500

■ Motors

Amongst their advantages, hydraulic motors from Bucher Hydraulics have a low weight-to-power ratio and are extremely compact. The variety of types, such as internal gear, external gear and the roller-stator design, provide the best solutions for vehicles and equipment such as agricultural and forestry machinery, construction plant, municipal vehicles, industrial trucks, winches and stationary equipment. Their suitability for energy-saving drive systems is a particular benefit for many applications.





■ Internal Gear Drive Units

All you ever wished for in a drive

■ Internal Gear Motors

High-speed motors

■ Internal Gear Flow Dividers

More than just a flow divider

■ External Gear Motors

Compact and robust

All you ever wished for in a drive

QXM Internal Gear Drive Unit



Features

- Fixed displacement motor
- For open and closed loop systems
- Operates as a pump or motor with change of rotation
- Reaction rate <50 ms
- Sound pressure level <50 dB(A)

Advantages

- Reversible for two- and four-quadrant operation
- Suitable for use with variable speed drives
- Over 50% energy saving possible
- Suitable for use with fire-resistant fluids such as HFB, HFC, HFD and others

Size		2	3	4	5	6	8
Displacement	cm ³ /rev	5 - 16	10.5 - 25.5	20.5 - 65	39.5 - 127.5	80 - 160.5	163 - 498.5
Torque	Nm	17 - 41	33.5 - 80	68 - 108	131 - 323	268 - 635	544 - 1267
Max. continuous pressure	bar	100 - 320	100 - 320	100 - 320	100 - 320	100 - 320	100 - 320
Max. intermittent pressure	bar	125 - 400	125 - 400	125 - 400	125 - 400	125 - 400	125 - 400
Max. speed (pump operation)	r/min	4500	3900	3200	2700	2050	1500
Max. speed (motor operation)	r/min	6000	5500	5000	4500	4000	3500

Size		2	3	4	5	6	8
Displacement	in ³ /rev	0.3 - 1.0	0.6 - 1.6	1.3 - 4.0	2.4 - 7.8	4.9 - 9.8	9.9 - 30
Torque	lbf ft	13 - 30	25 - 60	50 - 80	95 - 150	195 - 470	400 - 935
Max. continuous pressure	psi	1400 - 4600	1400 - 4600	1400 - 4600	1400 - 4600	1400 - 4600	1400 - 4600
Max. intermittent pressure	psi	1800 - 5700	1800 - 5700	1800 - 5700	1800 - 5700	1800 - 5700	1800 - 5700
Max. speed (pump operation)	r/min	4500	3900	3200	2700	2050	1500
Max. speed (motor operation)	r/min	6000	5500	5000	4500	4000	3500

High-speed motors

QXMHS Internal Gear Drive Motor



Features

- Fixed displacement motor
- For open loop systems
- External leakage connection
- Three additional connections for: Saw chain lubrication, Saw chain tension, Lubrication etc.
- Integrated valve functions
- Viscosity range
15 – 60 mm²/s (cSt) standard
up to 1,000 mm²/s at zero pressure cold start
- Reaction rate <50 ms
- Sound pressure level <50 dB(A)

Advantages

- Low operating temperature
- Withstands extremely high radial forces
- Long service life
- Maximal power output

Size		42-020	42-025	42-032
Displacement	cm ³ /rev	20.3	25.1	32.3
Torque	Nm	58	70	88
Max. continuous pressure	bar	240	240	240
Max. intermittent pressure	bar	280	280	280
Min. speed	r/min	100	100	100
Max. cont. speed	r/min	9500	7500	5500
Max. intermittent speed	r/min	14000	11000	8500

Size		42-020	42-025	42-032
Displacement	in ³ /rev	1.3	1.5	2.0
Torque	lbf ft	45	50	65
Max. continuous pressure	psi	3400	3400	3400
Max. intermittent pressure	psi	4000	4000	4000
Min. speed	r/min	100	100	100
Max. cont. speed	r/min	9500	7500	5500
Max. intermittent speed	r/min	14000	11000	8500

More than just a flow divider

QXT Internal Gear Flow Divider



Features

- Constant ratio flow divider
- For open and closed loop systems
- Works as a pressure intensifier
- Division accuracy >98%
- Sound pressure level <57 dB(A)
- Flow rates up to 2000 l/min (528 gpm)

Advantages

- Extremely high division accuracy
- Insignificant pressure pulsations
- 2, 3 or 4 Flow Configurations available
- Exceptionally quiet operation
- Suitable for use with fire-resistant fluids such as HFB, HFC, HFD and others

Size		22	32	42	52	62	82
Outlet Displacement	cm ³ /rev	5 - 8	12.5 - 15.5	25 - 32.5	50.5 - 64	101 - 125	201.5 - 249
Max. continuous pressure	bar	250	250	250	250	250	250
Max. intermittent pressure	bar	320	320	320	320	320	320
Max. speed	r/min	6300	5000	4000	3200	2500	2000
Min. speed	r/min	1250	1000	800	600	500	400
Max. flow Q _{in} with 2 outlet flows	l/min	63 - 100	120 - 160	200 - 250	320 - 400	500 - 630	800 - 1000
Max. flow Q _{in} with 3 outlet flows	l/min	95 - 150	180 - 240	300 - 380	480 - 600	750 - 950	1200 - 1500
Max. flow Q _{in} with 4 outlet flows	l/min	125 - 200	240 - 320	400 - 500	640 - 800	1000 - 1260	1600 - 2000

Size		22	32	42	52	62	82
Outlet Displacement	in ³ /rev	0.3 - 0.5	0.8 - 0.9	1.5 - 2.0	3.1 - 4.0	6.0 - 7.6	12 - 15
Max. continuous pressure	psi	3600	3600	3600	3600	3600	3600
Max. intermittent pressure	psi	4600	4600	4600	4600	4600	4600
Max. speed	r/min	6300	5000	4000	3200	2500	2000
Min. speed	r/min	1250	1000	800	600	500	400
Max. flow Q _{in} with 2 outlet flows	gpm	17 - 26.5	31.5 - 42.5	53 - 66	84.5 - 105.5	132 - 166	211 - 265
Max. flow Q _{in} with 3 outlet flows	gpm	25 - 39.5	47.5 - 63.5	79.5 - 100	127 - 159	198 - 251	317 - 396
Max. flow Q _{in} with 4 outlet flows	gpm	33 - 53	63.5 - 84.5	105.5 - 132	169 - 211	265 - 333	422 - 528



Compact and robust construction

APM External Gear Motor



Features

- Fixed displacement motor - unidirectional and reversible
- For open and closed loop systems
- Displacement: 0.5 – 26 cm³/rev (0.03 - 1.5 in³/rev)
- Maximum continuous pressure:

APM05	190 bar	(2700 psi)
APM100	210 bar	(3000 psi)
APM200	220 bar	(3100 psi)
APMR200	220 bar	(3100 psi)
APFM200	220 bar	(3100 psi)

Advantages

- Pressure related axial compensation
- APMR reversible motors available for 2- and 4-quadrant operation
- Versions with integrated valves available
- APFM motors specially designed for cooling system fan-drive applications
- Optional external bearing attachment for extreme load applications

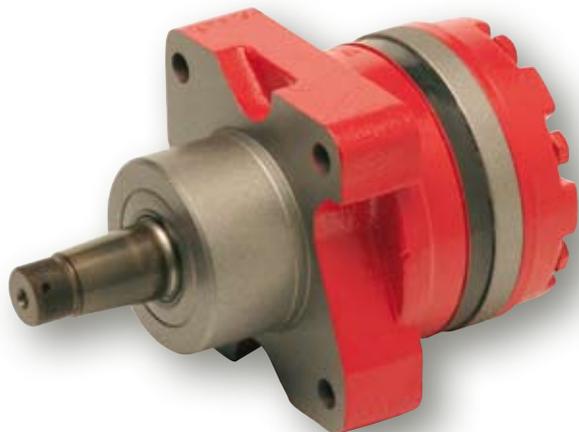
APM Standard version Model		APM05	APM100	APM200		APM05	APM100	APM200
Displacement	cm ³ /rev	0.5 - 1.5	2.5 - 10	8.5 - 26	in ³ /rev	0.03 - 0.09	0.15 - 0.6	0.5 - 1.6
Max. intermittent pressure	bar	200 - 230	200 - 280	220 - 250	psi	2900 - 3300	2900 - 4000	3100 - 3600
Speed range	r/min	700 - 7000	500 - 5000	600 - 4000	r/min	700 - 7000	500 - 5000	600 - 4000
Torque at max. cont. pressure	Nm	1.2 - 3.7	3.4 - 20	24.5 - 62.5	lbf ft	0.9 - 3	3 - 15	20 - 45

APMR Reversible version Model		APMR200			APMR200			
Displacement	cm ³ /rev	8.5 - 26			in ³ /rev	0.5 - 1.6		
Max. intermittent pressure	bar	220 - 250			psi	3100 - 3600		
Speed range	r/min	600 - 4000			r/min	600 - 4000		
Torque at max. cont. pressure	Nm	24 - 61.5			lbf ft	20 - 45		

APFM Fan-drive version Model		APFM200			APFM200			
Displacement	cm ³ /rev	8.5 - 26			in ³ /rev	0.5 - 1.6		
Max. intermittent pressure	bar	220 - 250			psi	3100 - 3600		
Speed range	r/min	600 - 4000			r/min	600 - 4000		
Torque at max. cont. pressure	Nm	24.5 - 62.5			lbf ft	20 - 45		

High torque hydraulic motors

Gerotor Motor



Features

- Fixed displacement motor
- Orbital motor
- Open loop system
- Parking brake or wheel hub can be attached
- Valves can be integrated or attached
- Speed sensing can be integrated

Advantages

- Can be installed without leakage line
- High starting torque
- High power
- Robust and compact design
- Consistent running over a wide speed range
- Long service life even in extreme operating conditions

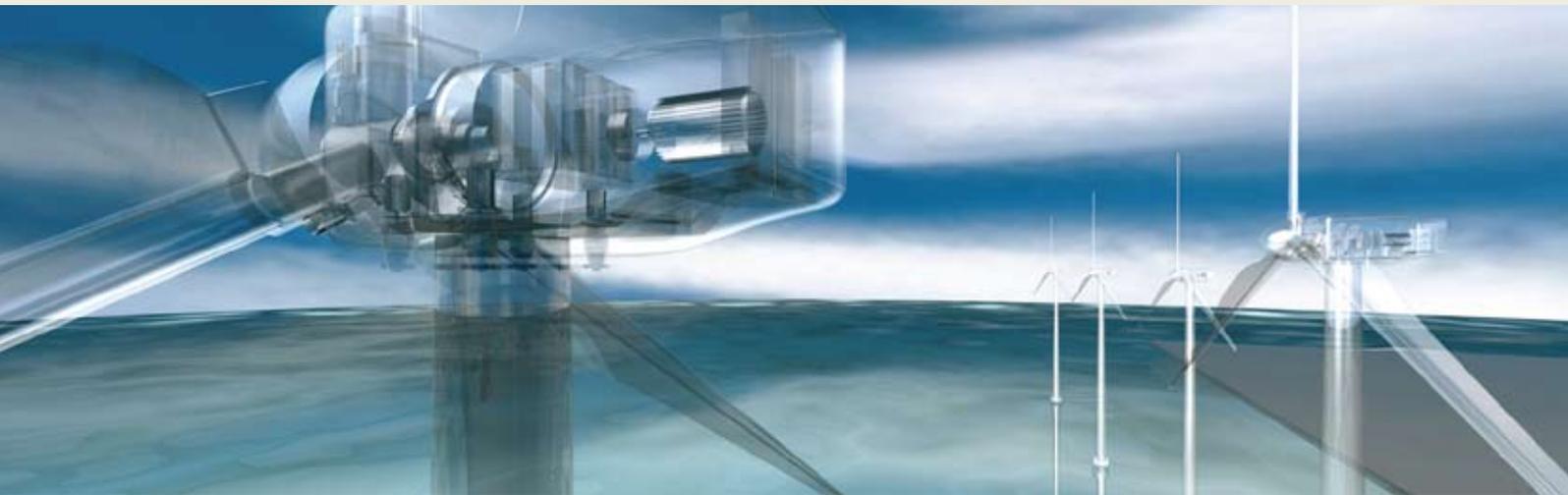
Model		BRE	BCE	BHB		BRE	BCE	BHB
Displacement	cm ³ /rev	121 - 748	121 - 748	52 - 409	in ³ /rev	7.3 - 45	7.3 - 45	3.2 - 25
Continuous torque	Nm	327 - 1096	322 - 1082	135 - 949	lbf ft	240 - 810	240 - 800	100 - 700
Max. cont. drop in pressure	bar	172 - 207	103 - 207	172 - 207	psi	2400 - 3000	1400 - 3000	2400 - 3000
Max. speed cont./intermitt.	r/min	360 - 490	360 - 490	680 - 950	r/min	360 - 490	360 - 490	680 - 950

Model		BDR	BDT	BWR		BDR	BDT	BWR
Displacement	cm ³ /rev	204 - 748	300 - 2093	41 - 400	in ³ /rev	12 - 45	12 - 128	2.4 - 25
Continuous torque	Nm	554 - 1107	819 - 2661	93 - 551	lbf ft	410 - 815	605 - 1965	70 - 405
Max. cont. drop in pressure	bar	103 - 207	103 - 207	104 - 155	psi	1400 - 3000	1400 - 3000	1400 - 3000
Max. speed cont./intermitt.	r/min	470 - 560	320 - 380	1110 - 1300	r/min	470 - 560	320 - 380	1110 - 1300

Model		BWP	BWG	BWS		BWP	BWG	BWS
Displacement	cm ³ /rev	50 - 388	41 - 404	100 - 496	in ³ /rev	3.2 - 24	2.4 - 25	6 - 30
Continuous torque	Nm	91 - 488	71 - 548	280 - 824	lbf ft	65 - 360	50 - 405	205 - 610
Max. cont. drop in pressure	bar	95 - 140	100 - 138	121 - 207	psi	1300 - 2000	1300 - 2000	1700 - 3000
Max. speed cont./intermitt.	r/min	155 - 1500	140 - 1020	155 - 880	r/min	155 - 1500	140 - 1020	155 - 880

■ Power Units

The UP range of power units are compact assemblies consisting of gear pump, electric motor valve block and oil tank. The wide variety of configurations and the simplicity of installation have made these power units highly popular in the vehicle and handling industries. They are predominantly used for lifting and lowering functions.





■ UP Hydraulic Power Packs

Compact and powerful

■ ET Electro-hydraulic Pumps

Motor-pump combination

Compact and powerful

Hydraulic Power Pack



Features

- Assembly consisting of gear pump, electric motor, valves and oil tank
- Available with steel or plastic oil tank
- Components such as check valves, pressure relief valves, emergency release valves, flow control valves, direct or pilot-operated directional control valves, manual valves and emergency hand pumps can be integrated
- Customized systems to meet your specifications

Advantages

- Application-related assembly
- Integrated valves
- Reduced stock level
- Easy installation
- Powerful combination

Model		UP50	UP100	UP110	M-series	
Max. pressure	bar	180 - 230	180 - 230	180 - 230	240	
Displacement	cm ³ /rev	0.25 - 1.6	1.2 - 10	1.2 - 10	0.36 - 4.18	
Tank capacity	l	0.5 - 4	1.5 - 18	1.5 - 14	0.5 - 23	
Viscosity range	mm ² /s (cSt)	20 - 120	20 - 120	20 - 120	20 - 77	
Fluid temperature range	°C	-15 to +80	-15 to +80	-15 to +80	-30 to +55	
DC motor	12...24/48 V	kW	0.35 - 2.5	0.7 - 3	1.5 - 3	0.8 - 4.5
AC motor	220/240 V	kW	0.12 - 0.75	0.25 - 2.2	0.25 - 2.2	0.5 - 2.2
	380 V	kW	0.12 - 0.75	0.25 - 4	0.25 - 4	-

Model		UP50	UP100	UP110	M-series	
Max. pressure	psi	2600 - 3300	2600 - 3300	2600 - 3300	3400	
Displacement	in ³ /rev	0.02 - 0.1	0.07 - 0.6	0.07 - 0.6	0.02 - 0.26	
Tank capacity	gal	0.13 - 1.06	0.4 - 4.8	0.4 - 3.7	0.13 - 6.08	
Viscosity range	cSt	20 - 120	20 - 120	20 - 120	20 - 77	
Fluid temperature range	°F	+5 to +176	+5 to +176	+5 to +176	-22 to +130	
DC motor	12...24/48 V	kW	0.35 - 2.5	0.7 - 3	1.5 - 3	0.8 - 4.5
AC motor	220/240 V	kW	0.12 - 0.75	0.25 - 2.2	0.25 - 2.2	0.5 - 2.2
	380 V	kW	0.12 - 0.75	0.25 - 4	0.25 - 4	-

Motor – Pump combination

ET Electro-hydraulic Pump



Features

- Hydraulic connections by pipe flanges or threaded ports
- Available with all external gear pumps in AP05 and AP100 ranges

Advantages

- Compact unit
- Powerful

Model		ET
Max. intermittent pressure	bar	250
Displacement	cm ³ /rev	0.25 - 10
Viscosity range	mm ² /s (cSt)	20 - 120
Fluid temperature range	°C	-15 to +80
DC motor	V	12, 24 and 48
Power	kW	0.8 - 2.2
Special functions		integrated pressure relief valve for AP100 only

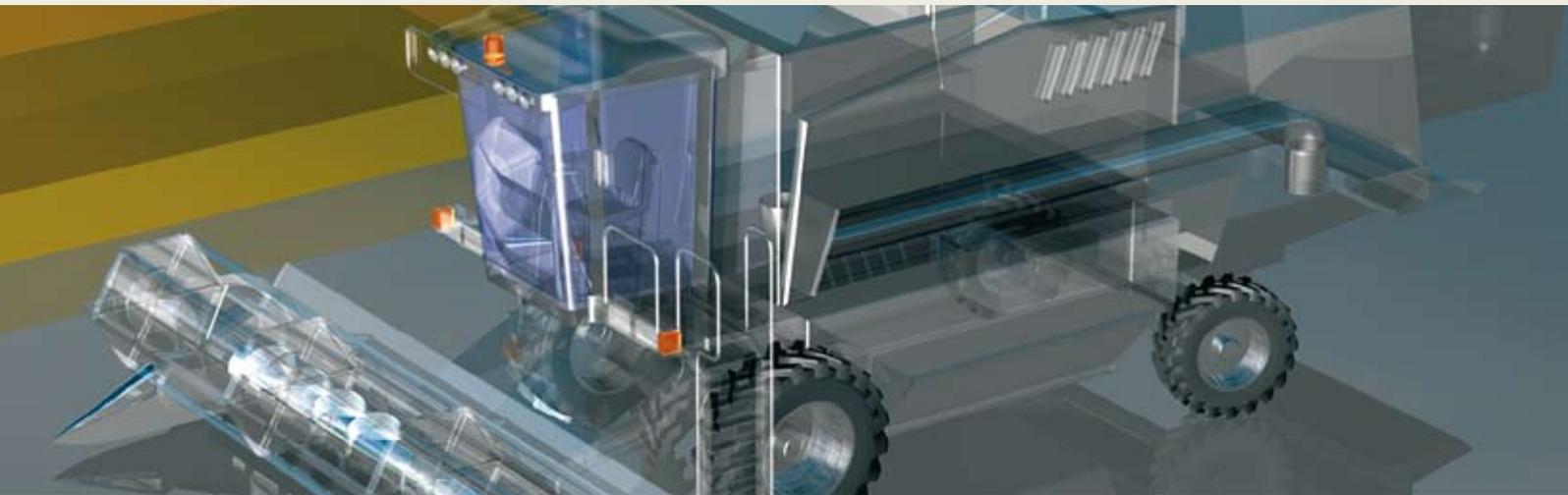
Model		ET
Max. intermittent pressure	psi	3600
Displacement	in ³ /rev	0.02 - 0.6
Viscosity range	cSt	20 - 120
Fluid temperature range	°F	+5 to +176
DC motor	V	12, 24 and 48
Power	kW	0.8 - 2.2
Special functions		integrated pressure relief valve for AP100 only

■ Directional Spool Valves

Directional spool valves are used in control and safety roles in the operating and travel hydraulics of mobile plant and machinery.

There are different designs and functions such as pressure compensators, pressure limiters, check, relief and flow valves to suit all requirements.

All the valve ranges employ a building block concept, elements of which can be put together in a valve block according to the requirements of the application.





■ **Monobloc Construction**

Compact

■ **Manifold Mounting**

Service-friendly, standardised and reliable

■ **Sectional Construction**

Modular building blocks for complex control tasks

Compact

HDM Monobloc directional control valve



Features

- Monobloc construction
- For series or parallel operation
- Open centre, closed centre and carry-over circuits
- Option for integrated anti-shock, anti-cavitation, pressure relief, flow control and check valves
- Single lever actuation for 2 valves and remote cable controls

Advantages

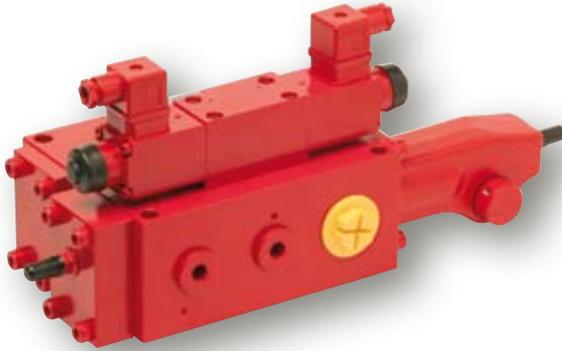
- Fatigue-free operation
- Minimal maintenance
- Compact overall dimensions
- Fine metering spools

Size		140	11P	11S	18	19WL
Number of spools		1	2 - 6	1 - 6	1 - 4	1 - 3
Max. continuous operating pressure	bar	250	250	350	350	250
Max. operating pressure	bar	320	320	400	400	320
Max. return pressure	bar	30	30	30	30	30
Nominal flow rate	l/min	40	45	45	70	70
Viscosity range	mm ² /s (cSt)	20 - 120	20 - 120	20 - 120	20 - 120	20 - 120
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	-20 to +80	-20 to +80
Actuation		Hand operated, electro-hydraulic on/off or hydraulic proportional actuation				

Size		140	11P	11S	18	19WL
Number of spools		1	2 - 6	1 - 6	1 - 4	1 - 3
Max. continuous operating pressure	psi	3600	3600	5000	5000	3600
Max. operating pressure	psi	4600	4600	5700	5700	4600
Max. return pressure	psi	430	430	430	430	430
Nominal flow rate	gpm	11	12	12	19	19
Viscosity range	cSt	20 - 120	20 - 120	20 - 120	20 - 120	20 - 120
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176	-4 to +176	-4 to +176
Actuation		Hand operated, electro-hydraulic on/off or hydraulic proportional actuation				

Compact

MV Proportional Directional Valve System



Features

- Monobloc construction
- Internal load feedback
- 2- or 3-way pressure compensation
- Individual adjustment of flow rates
- All valve functions are integrated in a single compact block
- Up to four proportional directional valve functions
- Primary pressure relief can be included

Advantages

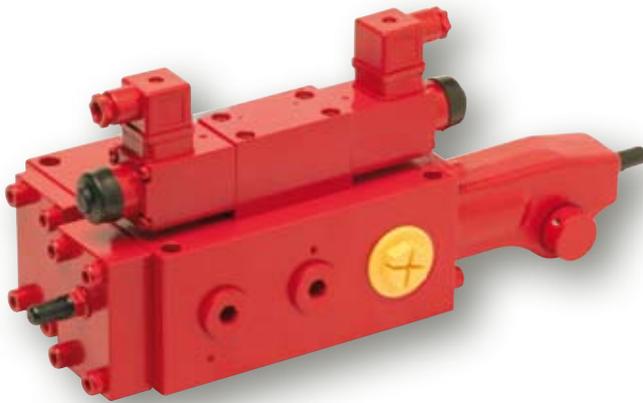
- Sensitivity and precision of load control
- Load-independent flow adjustment
- Specially developed for use in mobile hydraulics
- Perfectly matched to the application

Size		12	18	25
Max. working pressure	bar	350	350	350
Max. return pressure	bar	50	50	50
Nominal flow rate	l/min	100	200	450
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Electric, hydraulic, manual, EEx protection and combinations of these		

Size		12	18	25
Max. working pressure	psi	5000	5000	5000
Max. return pressure	psi	700	700	700
Nominal flow rate	gpm	26	53	119
Viscosity range	cSt	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Electric, hydraulic, manual, EEx protection and combinations of these		

Service-friendly and reliable

CV Proportional Directional Valve System



Features

- Compact manifold mounting design
- Internal load feedback
- 2- or 3-way pressure compensation
- Individual adjustment of flow rates
- Primary pressure relief can be included
- All valve functions are integrated in a single compact block

Advantages

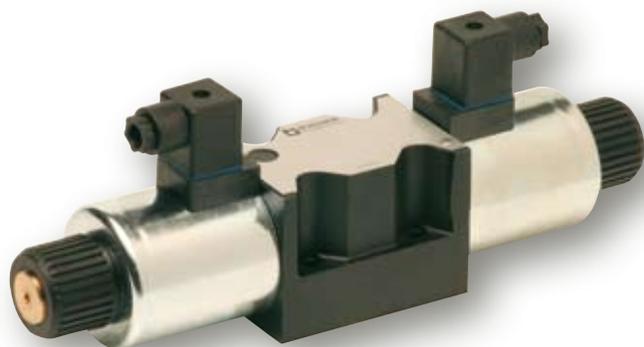
- Load-independent flow adjustment
- Sensitivity and precision of load control
- Perfect match to the application
- Easy maintenance due to quick-change of individual components means minimum service interruption

Size		12	18	25
Max. working pressure	bar	350	350	350
Max. return pressure	bar	50	50	50
Nominal flow rate	l/min	100	200	450
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Electric, hydraulic, manual, EEx protection and combinations of these		

Size		12	18	25
Max. working pressure	psi	5000	5000	5000
Max. return pressure	psi	700	700	700
Nominal flow rate	gpm	26	53	119
Viscosity range	cSt	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Electric, hydraulic, manual, EEx protection and combinations of these		

Standardised and reliable

Directional Solenoid Valves, Manifold Mounting (CETOP)



Features

- Mounting pattern:
ISO 4401-02-01 NG4
ISO 4401-03-02 NG6
ISO 4401-05-04 NG10
CETOP R35H 03, 05
DIN 24340 A6
DIN 24340 A10
NFPA D03, D05
- Direct acting seat valve
- Direct acting and two-stage spool valves

Advantages

- Available in explosion-protected versions
- Unaffected by asymmetric flow, high viscosities or high pressure differentials

Size		4	6	10
Max. working pressure	bar	250	350	315
Max. flow rate	l/min	25	100	160
Viscosity range	mm ² /s (cSt)	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80
Voltage	V	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC
Type of actuation		On/off solenoid, proportional solenoid, EEx solenoid, lever		
Protection class		IP65 (EN 60 529) for on/of and proportional solenoids; IP65 / IP67 for EEx solenoids		

Size		4	6	10
Max. working pressure	psi	3600	5000	4500
Max. flow rate	gpm	6.6	26	42
Viscosity range	cSt	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176
Voltage	V	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC
Type of actuation		On/off solenoid, proportional solenoid, EEx solenoid, lever		
Protection class		IP65 (EN 60 529) for on/of and proportional solenoids; IP65 / IP67 for EEx solenoids		

Multi-talented versatility

HDS Sectional directional control valve



Features

- Sectional construction
- For series or parallel operation
- Open centre, closed centre and carry-over circuits
- Option for integrated anti-shock, anti-cavitation, pressure relief, flow control and check valves
- Single lever actuation for 2 valves and remote cable controls

Advantages

- Differing types of actuation may be combined
- Minimal maintenance
- Customer specific control blocks for maximum flexibility
- Fine metering spools

Size		07	11	15	20	30
Number of spools		1 - 10	1 - 10	1 - 10	1 - 10	1 - 10
Max. continuous operating pressure	bar	250	250	250	250	250
Max. intermitt. operating pressure	bar	320	320	320	320	320
Max. return pressure	bar	20	30	30	30	30
Nominal flow rate	l/min	25	45	60	80	120
Viscosity range	mm ² /s (cSt)	20 - 120	20 - 120	20 - 120	20 - 120	20 - 120
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	-20 to +80	-20 to +80
Actuation		Hand operated, electro-hydraulic direct on/off or hydraulic proportional				

Size		07	11	15	20	30
Number of spools		1 - 10	1 - 10	1 - 10	1 - 10	1 - 10
Max. continuous operating pressure	psi	3600	3600	3600	3600	3600
Max. intermitt. operating pressure	psi	4600	4600	4600	4600	4600
Max. return pressure	psi	285	430	430	430	430
Nominal flow rate	gpm	6.6	12	16	21	32
Viscosity range	cSt	20 - 120	20 - 120	20 - 120	20 - 120	20 - 120
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176	-4 to +176	-4 to +176
Actuation		Hand operated, electro-hydraulic direct on/off or hydraulic proportional				

Modular building blocks for complex control tasks

L.8S Proportional Directional Valve



Features

- Sectional design
- Flexible system, specially developed for use in mobile hydraulics
- Additional functions can be incorporated in the modular system: Two- and three-way pressure compensation, priority pressure compensation, individual pressure compensation, check valves, load control valves, relief valves, anti-cavitation valves, flow cut-off, flow limiters, manual override

Advantages

- Load-sensing capability
- Suitable with all pump types and in systems with variable feeds
- Load-independent flow adjustment even in parallel operation with multiple consumers
- Complete solution with high functionality

Model		L.8S	L.8S	L.8S
Max. working pressure	bar	315	psi	4500
Nominal flow rate	l/min	150	gpm	40
Max. flow rate ports A + B	l/min	90	gpm	24
Max. return pressure	bar	40 (210)	psi	570 (3000)
Viscosity range	mm ² /s (cSt)	10 - 380	cSt	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	°F	-4 to +176
Voltage	V	12 or 24 DC	V	12 or 24 DC
Power consumption	W	27	hp	0.036
Type of actuation		Manual, on/off and proportional solenoid with direct and pilot actuation, hydraulic actuation		

Forward-looking technology

LVS Proportional Directional Valve



Features

- Sectional design
- Proportional flow-control functions, downstream pressure compensation, relief valve, make-up function, seat valve, manual override, two- and three-way pressure compensation, internal and external priority functions
- Flow control operation in one valve
- Available with specific operations for agricultural machinery, forestry equipment, construction machines, loading cranes and many other applications

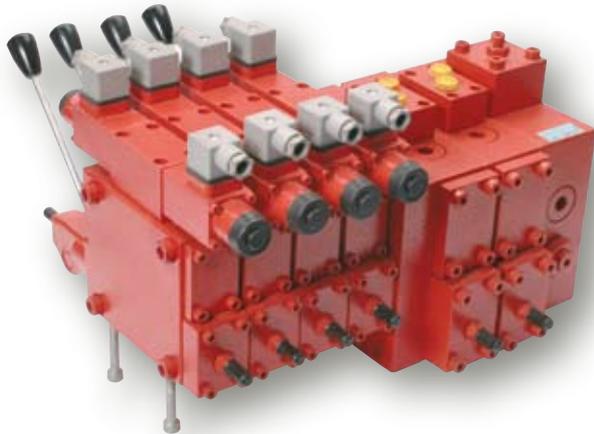
Advantages

- Increased handling capacity
- Lasting cost savings and increased machine performance data
- Fatigue-free operation
- Can be configured for both fixed and variable displacement pumps

Model		LVS08	LVS12		LVS08	LVS12
Max. working pressure	bar	250	350	psi	3600	5000
Nominal flow rate	l/min	260	260	gpm	69	69
Max. flow rate ports A + B	l/min	50	180	gpm	13	48
Max. return pressure	bar	200	50 (200 optional)	psi	2900	700 (2900 optional)
Viscosity range	mm ² /s (cSt)	10 to 380	10 to 380	cSt	10 to 380	10 to 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	°F	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	V	12 or 24 DC	12 or 24 DC
Power consumption	W	30	18	hp	0.040	0.024
Type of actuation		On/off and proportional solenoid with direct actuation	Manual operation, two-stage electro-hydraulic and hydraulic actuated, digital pilot head with on-board electronics		On/off and proportional solenoid with direct actuation	Manual operation, two-stage electro-hydraulic and hydraulic actuated, digital pilot head with on-board electronics

Modular building blocks for complex control tasks

SV Proportional Directional Valve



Features

- Compact sectional design
- Load feed-back
- Flexible building-block system
- Individual adjustment of flow rates
- Individual pressure compensation
- Individual flow cut-off for each consumer

Advantages

- Suitable with all pump types and in systems with variable feeds
- Sensitivity and precision of load control
- Load-independent flow adjustment even in parallel operation with multiple consumers
- Flexible modular system, specially developed for use in mobile hydraulics

Size		12	18	25		12	18	25
Max. working pressure	bar	350	350	350	psi	5000	5000	5000
Max. return pressure	bar	50	50	50	psi	700	700	700
Nominal flow rate	l/min	100	200	500	gpm	26	53	132
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	10 - 380	cSt	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	°F	-4 to +176	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC	V	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Electric, hydraulic, manual and combinations of these						

Modular building blocks for complex control tasks

LV Proportional Directional Valve



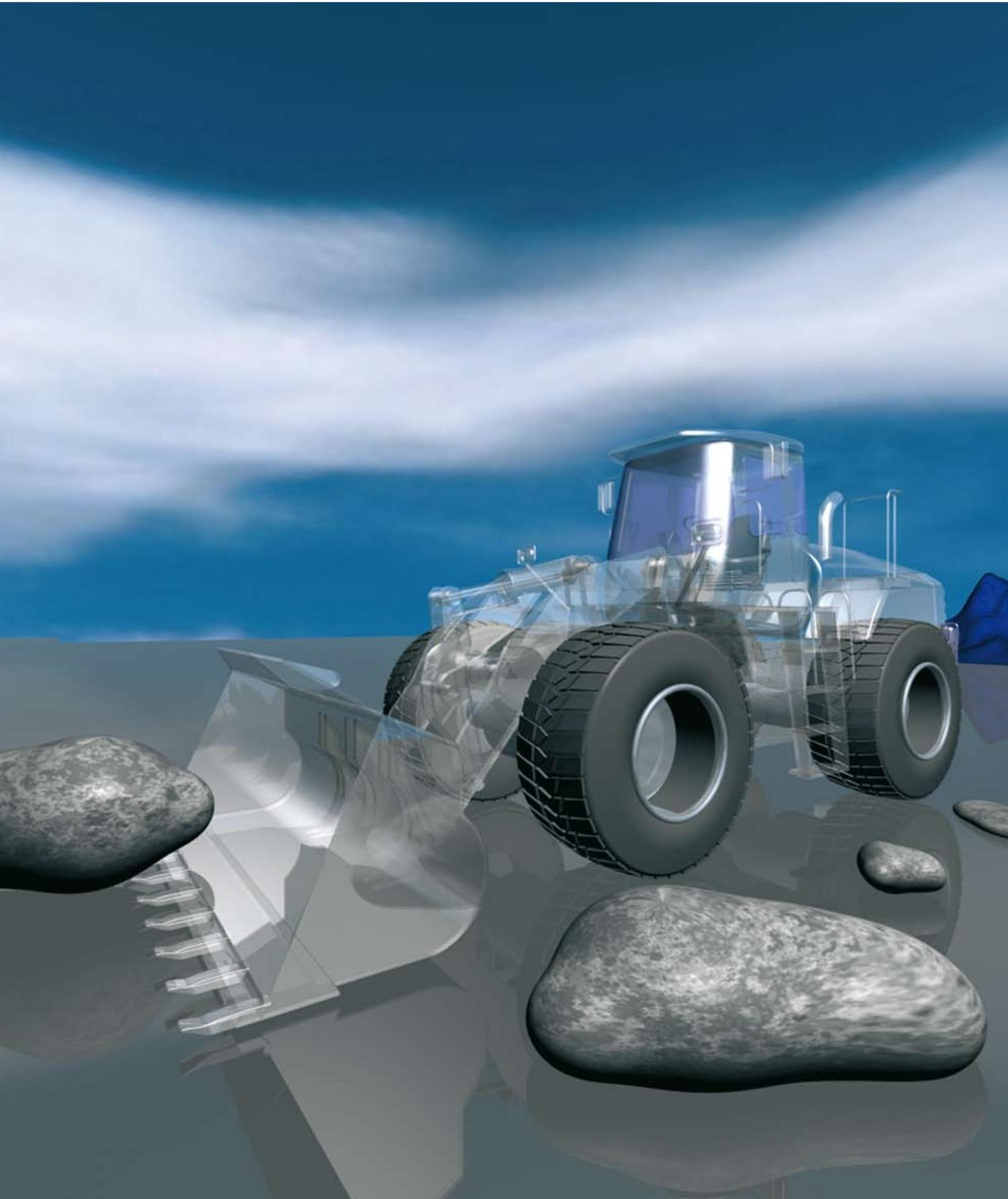
Features

- Compact sectional design
- Load Sensing
- Flexible building-block system
- Individual adjustment of flow rates
- Individual pressure compensation
- Individual flow cut-off for each consumer

Advantages

- Suitable with all pump types and in systems with variable feeds
- Sensitivity and precision of load control
- Load-independent flow adjustment even in parallel operation with multiple consumers
- Flexible modular system, specially developed for use in mobile hydraulics

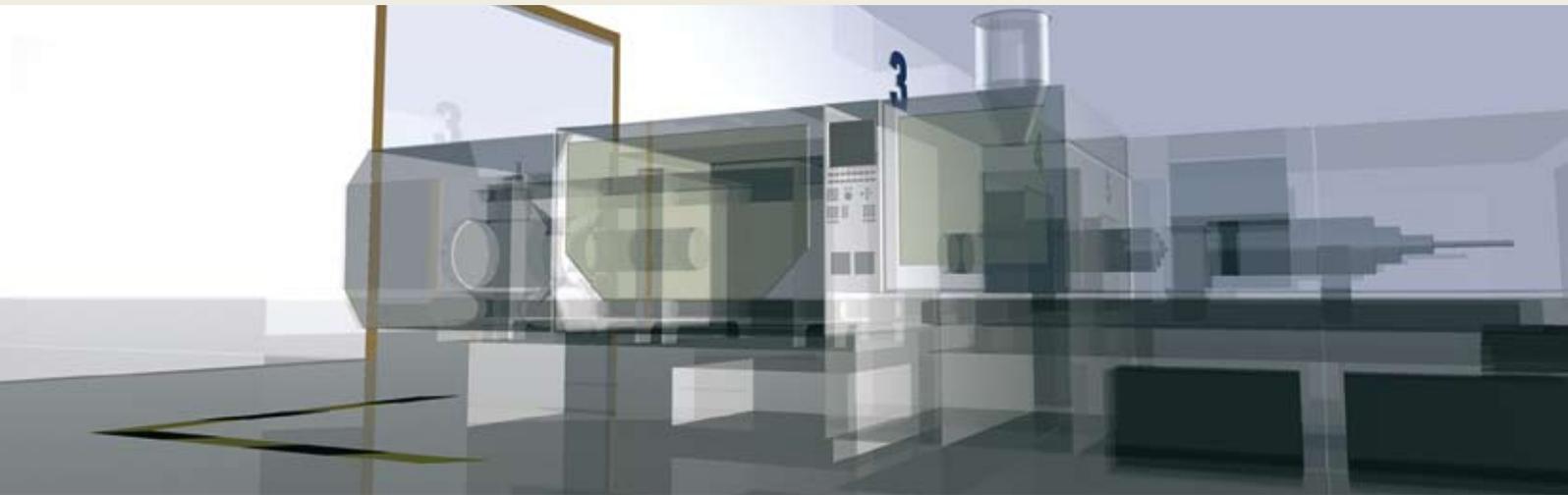
Size		16	22		16	22
Max. working pressure	bar	350	350	psi	5000	5000
Max. return pressure	bar	50	50	psi	700	700
Nominal flow rate	l/min	180	330	gpm	48	87
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	cSt	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	°F	-4 to +176	-4 to +176
Voltage	V	24 DC	24 DC	V	24 DC	24 DC
Type of actuation		Electric, hydraulic, and combined				

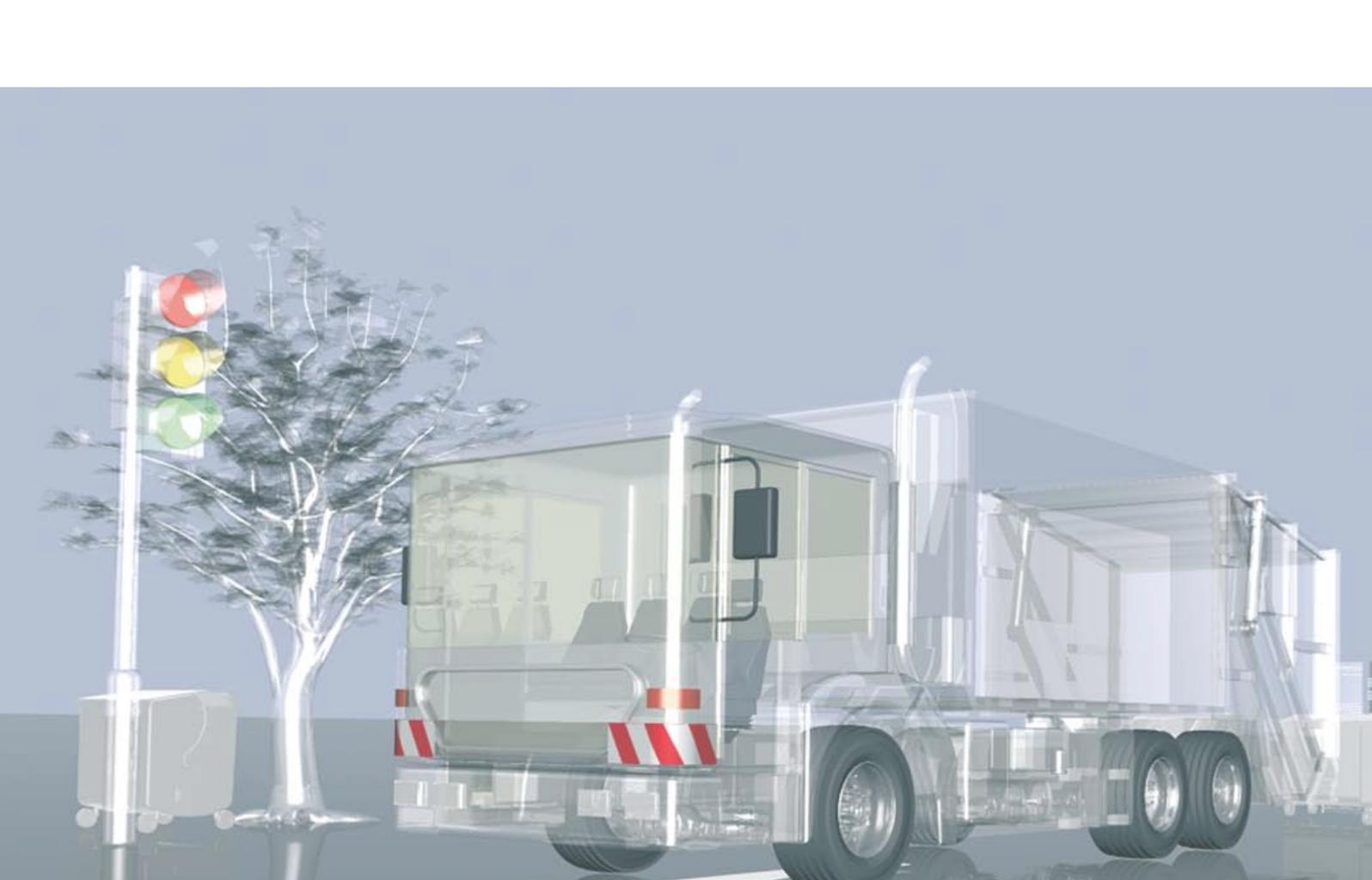


■ Cartridge Valves

Our cartridge valve range includes screw-in cartridges with UNF or metric threads as well as plug-in and SAE standard valves.

They are characterised by their compact design, great reliability and low maintenance. Due to the many different possible combinations these valves can be universally used for directional, pressure, flow-control and check purposes. Our range of seat valves offers considerable advantages which ensure leakage-free applications.





- Solenoid Directional Valves Screw-in and ready to go
- Pressure Valves Bypass and inline functions
- Solenoid Valves We can take the pressure
- Flow-control Valves For regulating flow volumes
- Check Valves Small and safe

Screw-in and ready to go

Solenoid Directional Cartridge Valve



Features

- Available either with UNF or metric threads
- Seat valves
- Spool valves
- Also available with an emergency override

Advantages

- Small installation size
- Rotatable solenoid
- Solenoid can be replaced without contact with fluids

Size		3	5	10	16
Max. operating pressure	bar	420	420	350	420
Max. flow rate	l/min	15	40	140	350
Viscosity range	mm ² /s (cSt)	10 - 500			
Hydraulic fluid temperature	°C	-25 to +80			
Voltage	V	12, 24 DC / 115, 230 AC			
Type of actuation		Solenoid	Solenoid EEx solenoid	Solenoid	Solenoid
Protection class		IP65 (EN 60 529) for solenoids IP65/IP67 (EN 60 529) for EEx solenoids			

Size		3	5	10	16
Max. operating pressure	psi	6000	6000	5000	6000
Max. flow rate	gpm	4	11	37	92
Viscosity range	cSt	10 - 500			
Hydraulic fluid temperature	°F	-13 to +176			
Voltage	V	12, 24 DC / 115, 230 AC			
Type of actuation		Solenoid	Solenoid EEx solenoid	Solenoid	Solenoid
Protection class		IP65 (EN 60 529) for solenoids IP65/IP67 (EN 60 529) for EEx solenoids			

Bypass and inline applications

Pressure Valve Cartridge



Features

- Directly and pilot controlled
- Pressure relief valves
- Pressure reducing valves
- Pressure compensator valves
- For bypass and inline applications
- Logic valves

Advantages

- Small installation size
- Excellent characteristics

Size		3	4	10	16
Max. operating pressure	bar	315	420	450	420
Max. flow rate	l/min	12	30	140	350
Viscosity range	mm ² /s (cSt)	10 - 500	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80	-25 to +80

Size		3	4	10	16
Max. operating pressure	psi	4500	6000	6400	6000
Max. flow rate	gpm	3	8	37	92
Viscosity range	cSt	10 - 500	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176	-13 to +176

We can take the pressure

Solenoid Pressure Valve Cartridge



Features

- Directly and pilot controlled
- Pressure relief valves
- Pressure reducing valves
- Pressure compensator valves
- External pilot connection
- 2 pressure settings
- Proportional or on/off solenoids

Advantages

- Small installation size
- One valve – continuously variable pressures
- 2 pressure settings

Size		3	5	10	16
Max. operating pressure	bar	420	315	315	420
Max. flow rate	l/min	20	60	120	350
Viscosity range	mm ² /s (cSt)	10 - 500			
Hydraulic fluid temperature	°C	-25 to +80			
Type of actuation		Proportional or on/off solenoid			
Voltage	V	12, 24 DC / 115, 230 AC			
Protection class		IP65 (EN 60 529)			

Size		3	5	10	16
Max. operating pressure	psi	6000	4500	4500	6000
Max. flow rate	gpm	5.3	16	32	92
Viscosity range	cSt	10 - 500			
Hydraulic fluid temperature	°F	-13 to +176			
Type of actuation		Proportional or on/off solenoid			
Voltage	V	12, 24 DC / 115, 230 AC			
Protection class		IP65 (EN 60 529)			

For regulating flow volumes

Flow-control Valve Cartridge



Features

- Directly and pilot controlled
- Seat and spool models available
- Throttle function
- Flow-control function
- Flow-control valve with adjustable
- Proportional or manual

Advantages

- Space-saving
- High quality
- Low pressure loss

Size		5	6	10	16
Max. operating pressure	bar	250	350	315	420
Max. flow rate	l/min	30	160	160	250
Viscosity range	mm ² /s (cSt)	10 - 500			
Hydraulic fluid temperature	°C	-25 to +80			
Type of actuation		Proportional	Manual	Proportional or manual	Proportional or manual
Voltage	V	12, 24 DC			
Protection class		IP65 (EN 60 529)			

Size		5	6	10	16
Max. operating pressure	psi	3600	5000	4500	6000
Max. flow rate	gpm	8	42	42	66
Viscosity range	cSt	10 - 500			
Hydraulic fluid temperature	°F	-13 to +176			
Type of actuation		Proportional	Manual	Proportional or manual	Proportional or manual
Voltage	V	12, 24 DC			
Protection class		IP65 (EN 60 529)			

Small and safe

Check Valves Cartridge Design



Features

- Screw-in or plug-in fitting
- With the RKVC and RVC ranges the checked direction is changed by inverting the cartridge
- Ball and plate valves
- Simple throttle/check functions can be achieved in plate valves by means of orifices in the plate
- Also available with hydraulic pilot operation

Advantages

- Small installation size
- High sealing properties
- High dynamics

Model		RV/RK	RW	REP
Nominal sizes		04 - 40 / 1/8" - 1 1/2"	2.5	10 - 16
Max. operating pressure	bar	350	315	350
Max. flow rate	l/min	360	8	300
Opening pressure	bar	0.2 - 12	0.16 - 6	2
Hydraulic fluid temperature	°C	-30 to +80	-25 to +80	-25 to +80

Model		RV/RK	RW	REP
Nominal sizes		04 - 40 / 1/8" - 1 1/2"	2.5	10 - 16
Max. operating pressure	psi	5000	4500	5000
Max. flow rate	gpm	95	2.1	79
Opening pressure	psi	3 - 174	2.3 - 90	30
Hydraulic fluid temperature	°F	-22 to +176	-22 to +176	-22 to +176

We control flow rates

Counterbalance Check Valve Cartridge Design



Features Daten

- Model provided with thread
- Ball version
- Can be used as a counterbalance valve
- Pipe-work installation version available on request

Advantages

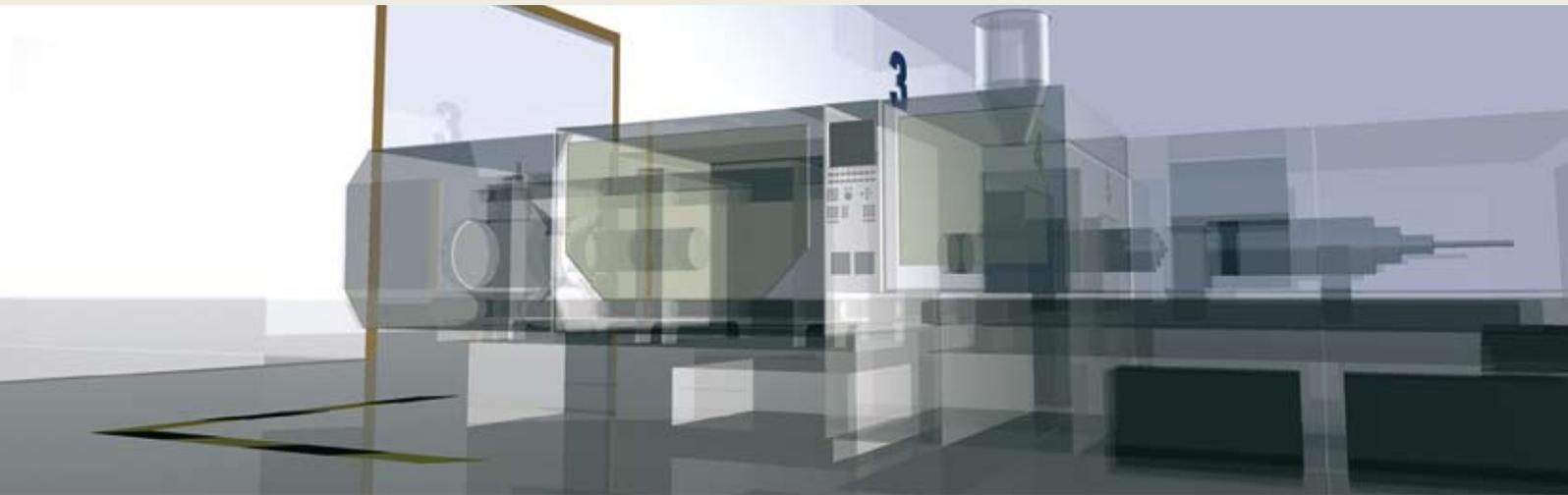
- Small installation size
- High level of leak tightness
- Flat characteristic curve

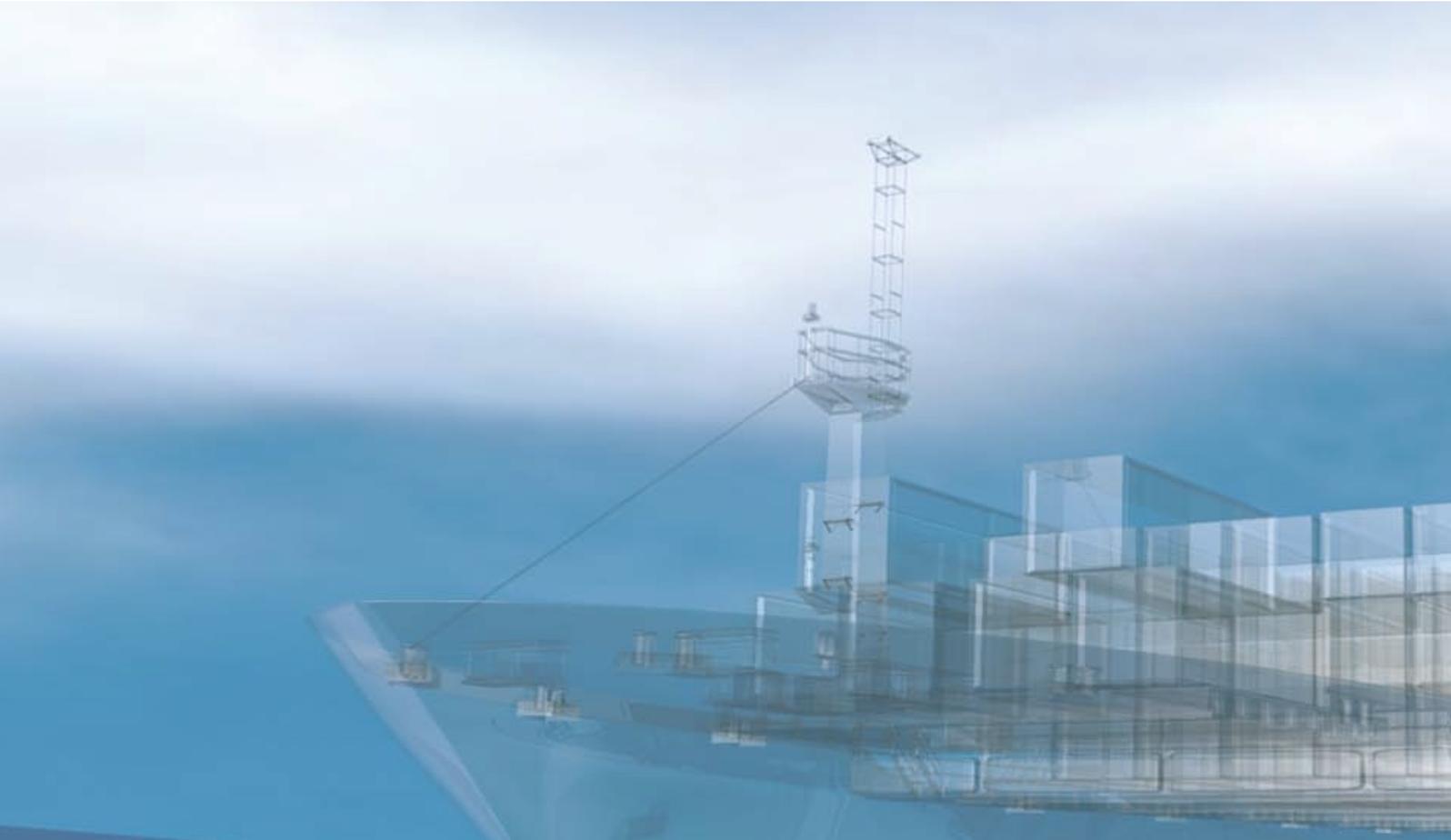
Model		RVVE		RVVE
Nominal sizes		04 - 40 / 1/8" - 1 1/2"		04 - 40 / 1/8" - 1 1/2"
Max. operating pressure	bar	350 (500)	psi	5000 (7100)
Max. flow rate	l/min	8 - 360	gpm	2.1 - 95
Opening pressure	mm ² /s	4 - 8 (12)	cSt	4 - 8 (12)
Hydraulic fluid temperature	°C	-30 bis +80	°F	-22 to +176

Stack Valves

Our stack valve programme offers items compliant with standards ISO 4401-02-01 NG4, ISO 4401-03-02 NG6, ISO 4401-05-04 NG10, ISO 4401-07-07 NG16, CETOP R35H 03, 05, 07, A6 as per DIN 24340, A10 as per DIN 24340, A16 as per DIN 24340, NFPA D03, D05 and D07.

On request we can supply customised units with innumerable operations linked in vertical and horizontal stacks.





- Solenoid Directional Valves Directly and pilot controlled
- Pressure Valves Keeping high pressures under control
- Check Valves Hardened seats
- Flow-control Valves For precise flow volume regulation
- Check Valves Safe and dynamic



Direct or pilot operated

Solenoid Directional Stack Valve



Features

- Mounting Pattern:
 ISO 4401-02-01 NG4
 ISO 4401-03-02 NG6
 ISO 4401-05-04 NG10
 ISO 4401-07-07 NG16
 CETOP R35H 03, 05, 07,
 DIN 24340 A6
 DIN 24340 A10
 DIN 24340 A16
 NFPA D03, D05 and D07
- Direct or pilot operated
- Normally open or normally closed
- Bypass check valve

Advantages

- Operating units designed for specific applications
- Standardised components
- Simple installation and dismounting

Size		6	10	16
Max. operating pressure	bar	350	350	350
Max. flow rate	l/min	140	140	300
Viscosity range	mm ² /s (cSt)	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80
Voltage	V	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC
Type of actuation		Solenoid	Solenoid	Solenoid
Protection class		IP65 (EN 60 529)	IP65 (EN 60 529)	IP65 (EN 60 529)

Size		6	10	16
Max. operating pressure	psi	5000	5000	5000
Max. flow rate	gpm	37	37	79
Viscosity range	cSt	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176
Voltage	V	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC
Type of actuation		Solenoid	Solenoid	Solenoid
Protection class		IP65 (EN 60 529)	IP65 (EN 60 529)	IP65 (EN 60 529)

Keeping high pressures under control

Stack-mounting Pressure Valve



Features

- Mounting Patterns
ISO 4401-02-01 NG4
ISO 4401-03-02 NG6
ISO 4401-05-04 NG10
ISO 4401-07-07 NG16
CETOP R35H 03, 05, 07,
DIN 24340 A6
DIN 24340 A10
DIN 24340 A16
NFPA D03, D05 and D07
- Units with pressure relief, pressure reducing and sequence functions
- Manually adjustable, on/off solenoid, Hi/Lo, proportional solenoid

Advantages

- A huge selection of standardised components
- Adjustable and lockable in use

Size		4	6	10	16
Max. operating pressure	bar	250	350	350	350
Max. flow rate	l/min	25	80	140	300
Viscosity range	mm ² /s (cSt)	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80	-25 to +80
Voltage		12, 24 DC / 115, 230 AC			
Type of actuation		Manually adjustable, solenoid, proportional solenoid			
Protection class		IP65 (EN 60 529)			

Size		4	6	10	16
Max. operating pressure	psi	3600	5000	5000	5000
Max. flow rate	gpm	6.6	21	37	79
Viscosity range	cSt	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176	-13 to +176
Voltage		12, 24 DC / 115, 230 AC			
Type of actuation		Manually adjustable, solenoid, proportional solenoid			
Protection class		IP65 (EN 60 529)			

Hardened seats

Stack-mounting Check Valve



Features

- Mounting Patterns
ISO 4401-02-01 NG4
ISO 4401-03-02 NG6
ISO 4401-05-04 NG10
ISO 4401-07-07 NG16
CETOP R35H 03, 05, 07,
DIN 24340 A6
DIN 24340 A10
DIN 24340 A16
NFPA D03, D05 and D07
- Check Valve
- Check valve also available with hydraulic pilot operation
- Direct or pilot operated

Advantages

- Compact design
- Standardised components
- Leak proof

Size		4	6	10	16
Max. operating pressure	bar	250	350	350	350
Max. flow rate	l/min	25	80	140	300
Viscosity range	mm ² /s (cSt)	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80	-25 to +80

Size		4	6	10	16
Max. operating pressure	psi	3600	5000	5000	5000
Max. flow rate	gpm	6.6	21	37	79
Viscosity range	cSt	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176	-13 to +176

For precise flow regulation

Stack-mounting Flow Control Valve



Features

- Hole Patterns
ISO 4401-02-01 NG4
ISO 4401-03-02 NG6
ISO 4401-05-04 NG10
ISO 4401-07-07 NG16
CETOP R35H 03, 05, 07,
DIN 24340 A6
DIN 24340 A10
DIN 24340 A16
NFPA D03, D05 and D07
- Simple throttle function
- With bypass check valve
- Two-way flow controller

Advantages

- Economical components and installation
- Standardised components
- All settings can be locked

Size		4	6	10	16
Max. operating pressure	bar	250	350	350	350
Max. flow rate	l/min	25	80	160	260
Viscosity range	mm ² /s (cSt)	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-25 to +80	-25 to +80

Size		4	6	10	16
Max. operating pressure	psi	3600	5000	5000	5000
Max. flow rate	gpm	6.6	21	42	69
Viscosity range	cSt	10 - 650	10 - 650	10 - 650	10 - 650
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-13 to +176	-13 to +176

Safe and dynamic

Check Valves for SAE Flange Connections



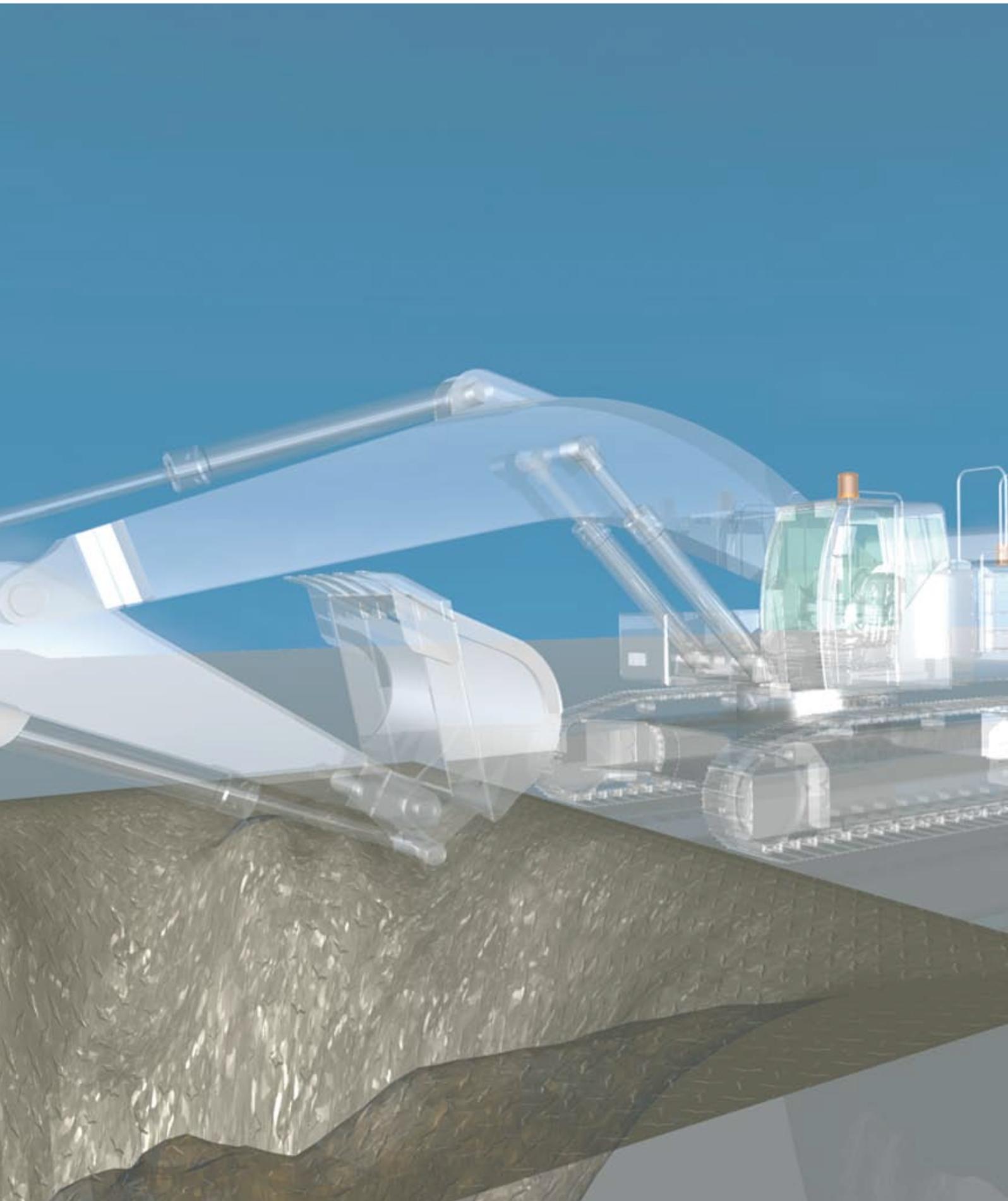
Features

- Fit between port and flange
- Checked direction can be changed by inverting the valve
- Optionally available: Throttle function in checked direction

Advantages

- Compact design
- Great sealing properties
- High dynamics
- Same valve body for 3000 psi and 6000 psi mounting pattern

Model				
Nominal Sizes		3/4" - 2 1/2"		3/4" - 2 1/2"
Max. operating pressure	bar	420	psi	6000
Nominal flow rate	l/min	Up to 1200	gpm	Up to 317
Opening pressure	bar	0.2 - 4	psi	3 - 60
Hydraulic fluid temperature	°C	-30 to +80	°F	-22 to +176



■ Safety Valves

Thanks to their extensive experience in the field of practical applications, Bucher Hydraulics are in a position to offer an extensive programme of special valves for mobile and stationary uses. Whenever heavy loads have to be moved or held it is essential to ensure first and foremost that all applicable safety regulations are adhered to.

The following pages contain just a few examples from the range of valves which meet these exacting standards.





■ **Special Valves**

Always the right solution

■ **Leak-free Load Control Valves**

Controlling loads safely

■ **Pipe Rupture Valves**

No uncontrolled movement

Always the right solution

Special Valve



Features

- FBVGA Double Travel Brake Valves
- ERV and DERV Check Valves

Advantages

- Valves comply with relevant safety regulations
- Designed specifically for particular applications
- Greatest possible safety

Model		FBVGA	ERV/DERV
Max. operating pressure	bar	350	450
Nominal flow rate	l/min	300	100
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80

Model		FBVGA	ERV/DERV
Max. operating pressure	psi	5000	6400
Nominal flow rate	gpm	79	26
Viscosity range	cSt	10 - 380	10 - 380
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176

Controlling loads safely

CINDY Leak-free Load Control Valve



Features

- SAE flange, block and cartridge designs
- Block-mounted valve with integral secondary pressure relief valve
- Pilot operated
- Available with load pressure over-compensation

Advantages

- Valve locks even if the spring breaks
- Load-control, check and pipe rupture valve functions all incorporated in a single valve axis
- Great durability due to leak-free, hardened and lapped valve seat parts
- Greatest possible protection against unintentional movement

Size		12	16	20	25
Max. operating pressure	bar	420	420	420	420
Secondary pressure	bar	460	460	460	460
Opening pressure	bar	A wide range of versions for all applications			
Nominal flow rate	l/min	150	250	350	500
Viscosity range	mm ² /s (cSt)	20 - 300			
Hydraulic fluid temperature	°C	-20 to +80			

Size		12	16	20	25
Max. operating pressure	psi	6000	6000	6000	6000
Secondary pressure	psi	6600	6600	6600	6600
Opening pressure	psi	A wide range of versions for all applications			
Nominal flow rate	gpm	40	66	92	132
Viscosity range	cSt	20 - 300			
Hydraulic fluid temperature	°F	-4 to +176			

Controlling loads safely and without leaks

CLC Leak-free Load Control Valve



Features

- Cartridge design
- SAE housing and block designs
- Body with threaded connector
- Pilot operate load control valve and bypass check valve in a single axis

Advantages

- Absolutely leakage-free load control
- Lowering operations practically independent of the load pressure
- Guaranteed to lock even if the spring fails
- Specific load control

Size		10		10	
Max. operating pressure	bar	350	psi	5000	
Secondary pressure	bar	420	psi	6000	
Opening pressure	bar	A wide range of versions for all applications		psi	A wide range of versions for all applications
Nominal flow rate	l/min	120	gpm	32	
Viscosity range	mm ² /s (cSt)	10 - 380	cSt	10 - 380	
Hydraulic fluid temperature	°C	-20 to +80	°F	-4 to +176	

Lifting, lowering, load control

REFUVA Load Control Valve



Features

- For pipework installation
- ¾", 1" and 1 ¼" SAE
- With integrated secondary pressure limiter

Advantages

- Leak-free load control
- Optimum Δp values during lifting and lowering operations
- Suitable for retro-fitting
- No adjustment to the directional valve necessary

Size	25		25	
Max. operating pressure	bar	420	psi	6000
Opening pressure	bar	Many different versions	psi	Many different versions
Max. flow rate	l/min	300	gpm	79
Viscosity range	mm ² /s (cSt)	15 - 380	cSt	15 - 380
Hydraulic fluid pressure	°C	-25 to +80	°F	-13 to +176

Fail-safe movement control

Pipe Rupture Valves for Excavators



Features

- Fulfil the requirements of ISO 8643 and EN 474-5 standards for earth-moving machinery
- Direct attachment via SAE 6000 psi flange
- Compact design, with either pilot or direct control
- Pressure limiting valve independent of the return pressure
- Secondary pressure limiting with no additional tank line

Advantages

- Insignificant lowering pressures
- Greatest possible protection against unintentional movement
- Adjustable flow for lock activation
- No need to change any of the hydraulic adjustments already made to the equipment
- Leak-free load control

Model		ESV16	ESV20	ESV25	CFS16	CFS20
Max. operating pressure	bar	420	420	420	420	420
Nominal flow rate	l/min	250	350	500	250	350
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-30 to +90				

Model		ESV16	ESV20	ESV25	CFS16	CFS20
Max. operating pressure	psi	6000	6000	6000	6000	6000
Nominal flow rate	gpm	66	92	132	66	92
Viscosity range	cSt	10 - 380	10 - 380	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°F	-22 to +194				

No uncontrolled motion

RS Pipe Rupture Valve



Features

- Cartridge design
- Screw in cartridges for pipe connection
- Ball valve or plate valve

Advantages

- Very little space required
- Flow rate easily adjusted
- Adjustable flow for lock activation
- Greatest possible protection against unintentional movement

Size		8	12	16	32
Max. operating pressure	bar	400	400	400	350
Nominal flow rate	l/min	40	80	160	400
Viscosity range	mm ² /s (cSt)	20 - 380	20 - 380	20 - 380	20 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	-20 to +80

Size		8	12	16	32
Max. operating pressure	psi	5700	5700	5700	5000
Nominal flow rate	gpm	11	21	42	105
Viscosity range	cSt	20 - 380	20 - 380	20 - 380	20 - 380
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176	-4 to +176

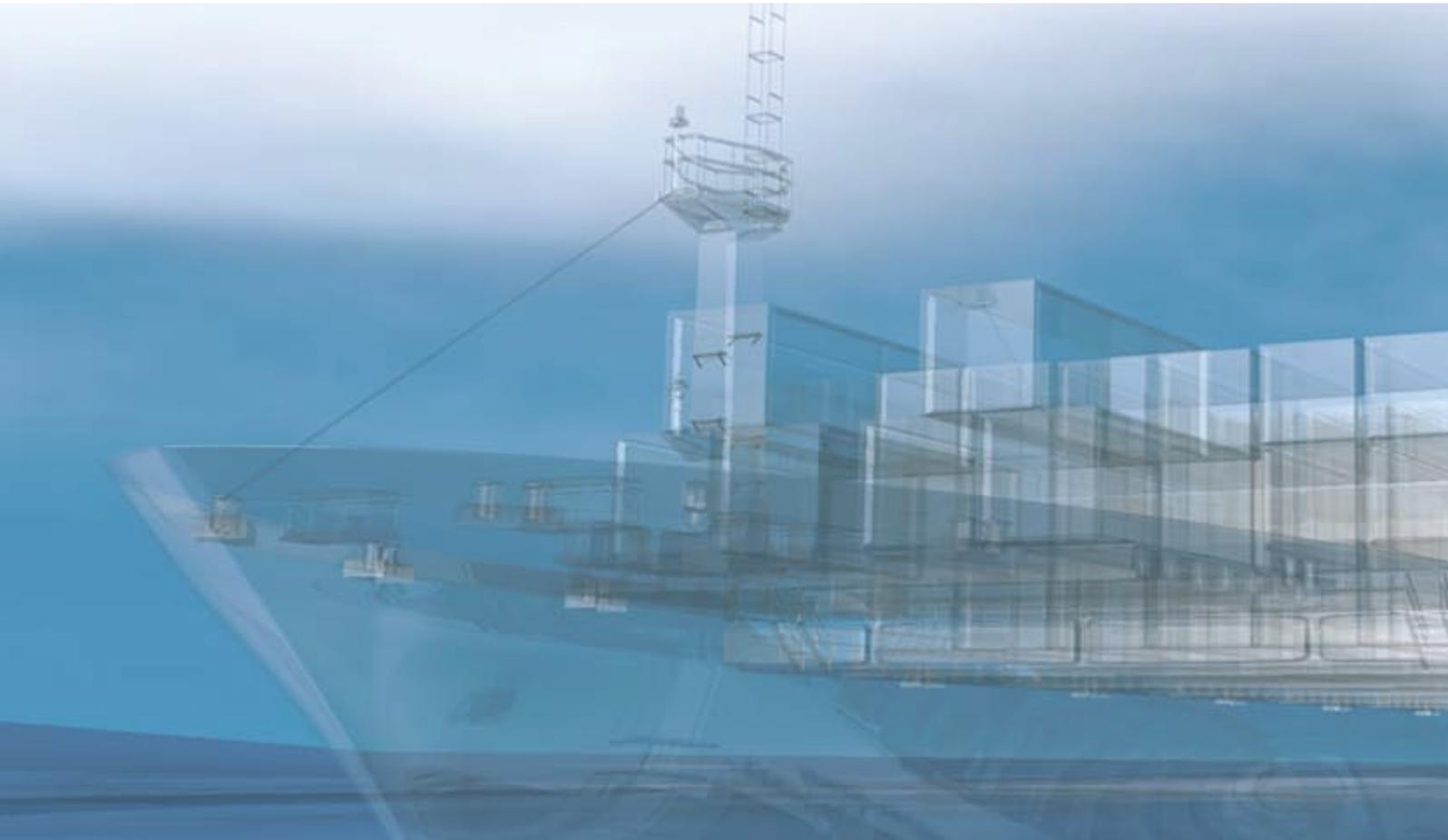
■ Explosion Protected Valves

On 1st July, 2003 the European Parliament issued new directives concerning minimum levels required to improve the health and safety protection of workers who could be endangered by potentially explosive atmospheric conditions.

Since that date any products brought into circulation must comply with these new directives.

Bucher Hydraulics supplies compliant hydraulic components.





- Valves for Potentially Explosive Areas

European explosion protection legislation

- Proportional Directional Valve System incorporating an Explosion Protected Design

Simple, safe and precise



European explosion protection legislation

Valve for Potentially Explosive Areas



Features

- Examples of applications:
In gaseous atmospheres, II 2 G
In dust atmospheres, II 2 D
- Solenoids:
EEx em T4 enhanced safety / metal casting encapsulation
EEx d II C T4...T6 pressure resistant encapsulation
- W- type solenoid valves in block, cartridge or pipework design
- Directly and pilot controlled

Advantages

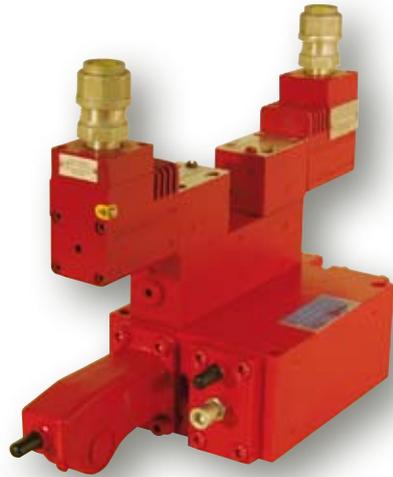
- Compliant with ATEX safety requirements
- EC Type Approval Certification
- Rugged construction

Model		EEx-WED	EEx-WEV	EEx-W1
Nominal size		6	6 + 10	6
Max. operating pressure	bar	180	315	315
Max. flow rate	l/min	18	60 - 90	20
Viscosity range	mm ² /s (cSt)	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°C	-25 to +80	-25 to +80	-
Voltage	V	24 DC / 115, 230 AC	24 DC / 115, 230 AC	24 DC / 230 AC
Protection class		IP65/IP67 (EN 60 529)	IP65/IP67 (EN 60 529)	IP65/IP67 (EN 60 529)

Model		EEx-WED	EEx-WEV	EEx-W1
Nominal size		6	6 + 10	6
Max. operating pressure	psi	2600	4500	4500
Max. flow rate	gpm	4.8	16 - 24	5.3
Viscosity range	cSt	10 - 500	10 - 500	10 - 500
Hydraulic fluid temperature	°F	-13 to +176	-13 to +176	-
Voltage	V	24 DC / 115, 230 AC	24 DC / 115, 230 AC	24 DC / 115, 230 AC
Protection class		IP65/IP67 (EN 60 529)	IP65/IP67 (EN 60 529)	IP65/IP67 (EN 60 529)

Simple, safe and precise

Proportional Directional Valve Incorporating an Explosion Protected Design



Features

- Explosion protected controls (e.g. for off-shore applications)
- Intrinsically safe controls for mining operations
- Several ranges available (CV, LV, MV, SV)
- Models available which are compliant with explosion protection categories:
CE EX I M2 EEx ia I
CE EX II G EEx d IIC
CE EX II 2 G EEx m II

Advantages

- Electrically proportional or on/off controls in areas requiring a high level of protection
- Advantage over competitors' products: Use of precise electrical proportional controls in areas where it has previously only been possible to install manually or hydraulically operated valves

Size		12	16	18	22	25
Max. operating pressure	bar	350	350	350	350	350
Max. return pressure	bar	50	50	50	50	50
Nominal flow rate	l/min	100	180	200	330	500
Viscosity range	mm ² /s (cSt)	10 - 380	10 - 380	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	-20 to +80	-20 to +80
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Also in combination with manual or hydraulic actuation				

Size		12	16	18	22	25
Max. operating pressure	psi	5000	5000	5000	5000	5000
Max. return pressure	psi	700	700	700	700	700
Nominal flow rate	gpm	26	48	53	87	132
Viscosity range	cSt	10 - 380	10 - 380	10 - 380	10 - 380	10 - 380
Hydraulic fluid temperature	°F	-4 to +176	-4 to +176	-4 to +176	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	12 or 24 DC	12 or 24 DC	12 or 24 DC
Type of actuation		Also in combination with manual or hydraulic actuation				

■ Directional Seat Valves

These lightweight aluminium valves are suitable for controlling single or double acting actuators. They are particularly suited to applications which demand a high degree of leak tightness.

They are directly controlled 2/2 bi-directional seat valves which are solenoid operated. Their purpose is to control the feed and return pipes on hydraulic equipment with virtually zero leakage.





■ Seat Valves

Zero leakage

■ Directional Seat Valves

Lightweight and space-saving

Virtually zero leakage

SVH04 Seat Valve



Features

- Monobloc design with add-on sections
- Sectional construction allows for customised valve blocks
- Emergency override
- Integrated pressure limiter is optionally available
- Can be combined with other directional valve ranges

Advantages

- Leak-free sealing of feed and return pipes on hydraulic equipment
- Economic alternative to conventional designs
- Minimal dimensions

Model		SVH04		SVH04
Max. operating pressure	bar	250	psi	3600
Nominal flow rate	l/min	20	gpm	5.3
Max. flow rates ports A and B	l/min	20	gpm	5.3
Viscosity range	mm ² /s (cSt)	10 - 300	cSt	10 - 300
Hydraulic fluid temperature	°C	-20 to +80	°F	-4 to +176
Voltage	V	12 or 24 DC	V	12 or 24 DC
Power consumption	W	27	hp	0.036
Type of actuation		Direct solenoid operation		Direct solenoid operation

Lightweight and space-saving

WSH03 Directional Seat Valve



Features

- Monobloc design
- Lightweight aluminium construction
- 3/2 directional spool valve followed by a 2/2 directional seat valve
- Integrated manual override
- Pressure limiters and flow valves also available as options

Advantages

- Leak-free sealing
- Extremely space-saving
- Lightweight

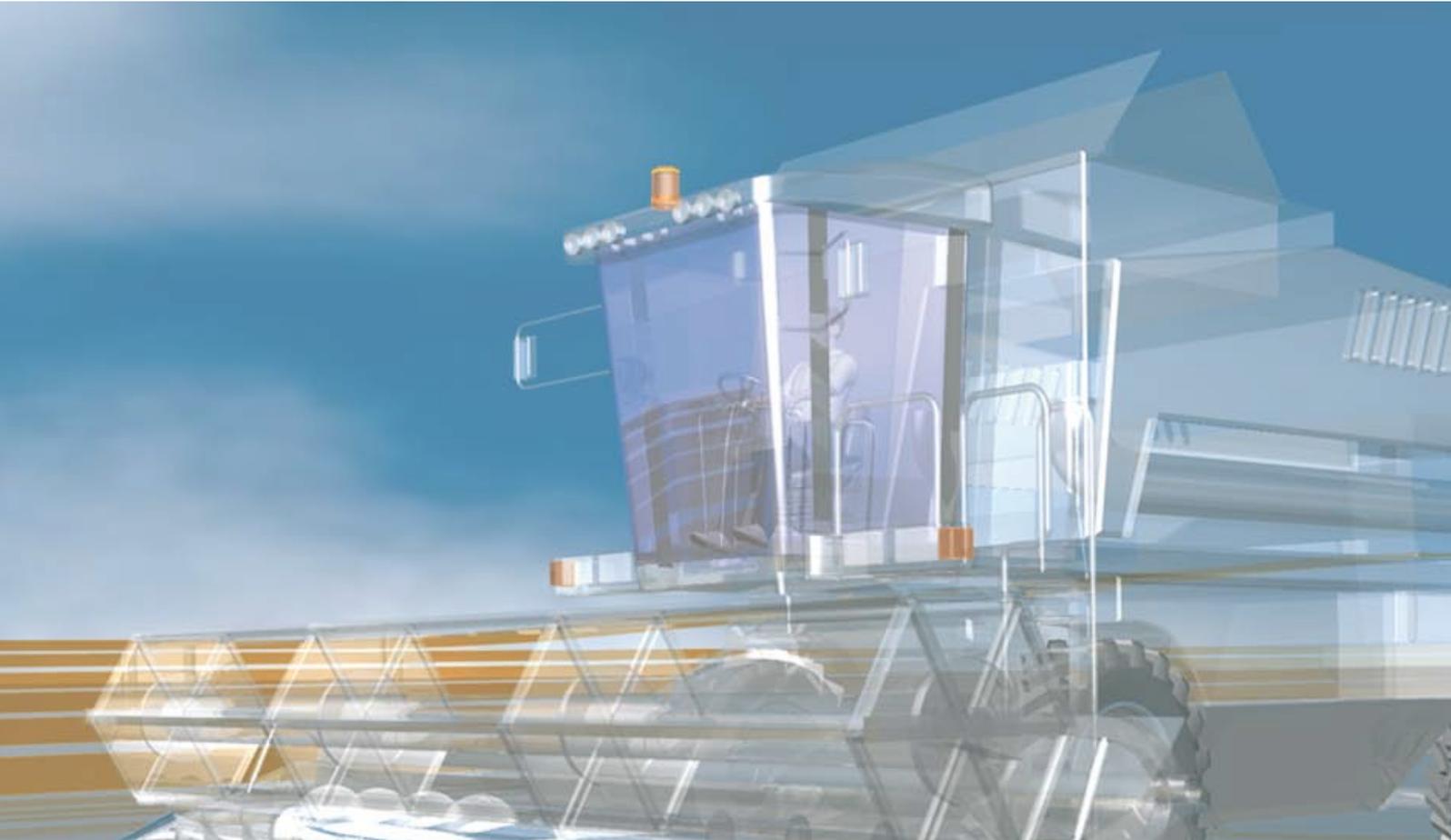
Model		WSH03		WSH03
Max. operating pressure	bar	250	psi	3600
Nominal flow rate	l/min	25	gpm	6.6
Max. flow rates ports A and B	l/min	25	gpm	6.6
Viscosity range	mm ² /s (cSt)	10 - 300	cSt	10 - 300
Hydraulic fluid temperature	°C	-20 to +80	°F	-4 to +176
Voltage	V	12 or 24 DC	V	12 or 24 DC
Power consumption	W	27	hp	0.036
Type of actuation		Direct solenoid operation		Direct solenoid operation

■ Flow Valves

Flow dividers and flow control valves are frequently used in mobile utility vehicles and stationary plant. Depending on the requirements involved, there are many different designs and additional functional features such as pressure relief valves, bypass valves, lock valves and shock valves.

Differential lock valves have been developed specifically for applications in hydrostatic drives with hydraulic motors connected in parallel in open and closed loop systems.





■ **Flow Dividers**

for precise flow rate division

■ **Flow Control Valves**

precise, safe and economical

■ **Differential Lock Valves**

for locking transmissions professionally

For precise flow rate division

Flow Divider



Features

- For installation in pipework
- Various division ratios
- Options:
 - Final position adjustment
 - Anti-cavitation valve
 - Check valve
 - Pressure relief valve

Advantages

- Precise flow rate division and merging
- No maintenance required
- Also available as a high-pressure flow divider up to 420 bar (6000 psi)

Model	MTDA08		MTDA16	MTDA08		MTDA16	
		bar	315 / 420	315	psi	4500 / 6000	4500
Max. operating pressure		bar	315 / 420	315	psi	4500 / 6000	4500
Flow range Q_{in}		l/min	2 - 100	35 - 250	gpm	0.5 - 26	9 - 66
Control accuracy		%	± 3	± 3	%	± 3	± 3
Viscosity range		mm ² /s (cSt)	10 - 300	10 - 300	cSt	10 - 300	10 - 300
Hydraulic fluid temperature		°C	-20 to +80	-20 to +80	°F	-4 to +176	-4 to +176

Precise, safe and economical

Flow Control Valves



Features

- For installation in pipework
- Manually adjusted
- Surplus flow can be pressurised (MTKA, MTCA)
- Total flow protected by pressure relief valve (MTQA and MTCA)

Advantages

- Control flow rates economically
- No maintenance required
- Just one turn of the adjuster for the entire control range

Model		MTKA	MTQA	MTCA		MTKA	MTQA	MTCA
Max. operating pressure	bar	315	315	315	psi	4500	4500	4500
Nominal flow rate	l/min	70	70	80	gpm	19	19	21
Adjustment range, variable	l/min	0 - 65	0 - 65	0 - 65	gpm	0 - 17	0 - 17	0 - 17
Fixed adjustment range	l/min	3 - 60	3 - 60	3 - 60	gpm	0.8 - 16	0.8 - 16	0.8 - 16
Viscosity range	mm ² /s (cSt)	10 - 300	10 - 300	10 - 300	cSt	10 - 300	10 - 300	10 - 300
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	-20 to +80	°C	-4 to +176	-4 to +176	-4 to +176

Load-independent flow control

SR. Flow Control Valves



Features

- Configurations:
 - Cartridge design
 - Pipe-work installation type
 - Motor/pump assembly
 - Valve manifold solutions with integrated additional operations
- 2 and 3 way modes
- Residual flow is resistant to compressive stress

Advantages

- Constant performance under varying temperature and load conditions
- Easy coil change, without disturbing fluid area
- No maintenance necessary
- Distinctive fine-adjustment range
- Sturdy, simple, safe in operation

Model		SRR	SRC		SRR	SRC
Max. operating pressure	bar	315	315	psi	4500	4500
Nominal flow rate	l/min	100	100	gpm	26	26
Constant flow range	l/min	0 - 80	0 - 80	gpm	0 - 21	0 - 21
Power consumption	W	27.6		hp	0.037	
Viscosity range	mm ² /s (cSt)	10 - 300		cSt	10 - 300	
Hydraulic fluid temperature	°C	-20 to +80		°F	-4 to +176	
Voltage	V	12 or 24 DC		V	12 or 24 DC	
Type of actuation		Hand-wheel, firmly adjusted, proportional solenoid			Hand-wheel, firmly adjusted, proportional solenoid	

Lock transmissions professionally

MT..DV Differential Lock Valves



Features

- Valve manifold solutions optimized to suit installation positions
- Optionally available with threaded connections or SAE flange attachments
- Balancing orifices for best possible performance
- Two-way and three-way lock
- Pressure relief, shock and anti-cavitation valves available as options

Advantages

- Robust and reliable
- No maintenance required
- Precise performance with no need for elaborate electronics

Model		MT..DV	MT..DVD		MT..DV	MT..DVD
Max. operating pressure	bar	420	420	psi	6000	6000
Max. flow rate Q _{max}	l/min	100	250	gpm	26	66
Nominal flow rate	l/min	25, 50, 75, 100	120, 160, 200, 250	gpm	6.6, 13, 20, 26	32, 42, 53, 66
Viscosity range	mm ² /s (cSt)	10 - 300	10 - 300	cSt	10 - 300	10 - 300
Hydraulic fluid temperature	°C	-20 to +80	-20 to +80	°F	-4 to +176	-4 to +176
Voltage	V	12 or 24 DC	12 or 24 DC	V	12 or 24 DC	12 or 24 DC
Power consumption	W	30	30	hp	0.040	0.040
Type of actuation		Electro-hydraulic pilot operation, hydraulic pilot operation			Electro-hydraulic pilot operation, hydraulic pilot operation	

■ Mobile Electronics

We have designed mobile electronic components specifically for applications in mobile plant and machinery. Their reliability under temperature fluctuations, rough mechanical loadings and electromagnetic interference conditions has been proven by rigorous testing and they have stood the test of time in production applications.

CAN-Bus and GPS compatibility, programmability and customer-specific operating controls ensure their communication with other machine systems and their suitability for the application requirements.





■ Joysticks

Everything to hand

■ Controls

Display the operational status

■ Amplifier and Control PCB's

Always the right solution

Everything to hand

Joysticks



Features

- Suitable for finely-tuned control of driving and operating functions
- Internal sensors with non-contact position sensing
- Further special models available on request
- Various handgrip configurations, also with hand rests

Advantages

- Compact design with minimal installation dimensions
- Simple, fatigue-proof operation
- Great reliability

Model	FGE	FGE/JS4	FCE	FCEG
Function	Lever switch	Prop. signal source	Prop. signal source	Prop. signal source
Signal	On / Off	Variable	Variable	Variable
Application	On-off solenoid	Prop. solenoid	CAN-Bus	CAN-Bus
Voltage	V 9 - 30 DC	4.75 - 15 DC	9 - 30 DC	9 - 30 DC
Protection class	IP33	IP45 / IP33	IP65	IP65

Display the operational status

Operating Controls



Features

Bucher Hydraulics offer a wide range of operating controls with displays, pushbuttons and switches in a multitude of designs.

- Either as stand-alone units or for installation in control panels
- Analogue or digital controls
- Also available microprocessor controlled with diagnostic capability, PC interface and GPS connection

Advantages

- Compact design with minimal installation dimensions
- Simple, fatigue-free operation
- Great reliability

Model	Proportional Amplifiers	Analogue Control Units	Digital Control Unit
Power outputs	1	1	2
Switched outputs	1 - 2	1	
Application	Proportional solenoids	Proportional solenoids	CAN-Bus
Voltage	V 12 - 30 DC	12 - 24 DC	12 - 30 DC

Always the Right Solution

Amplifier and Control PCB's



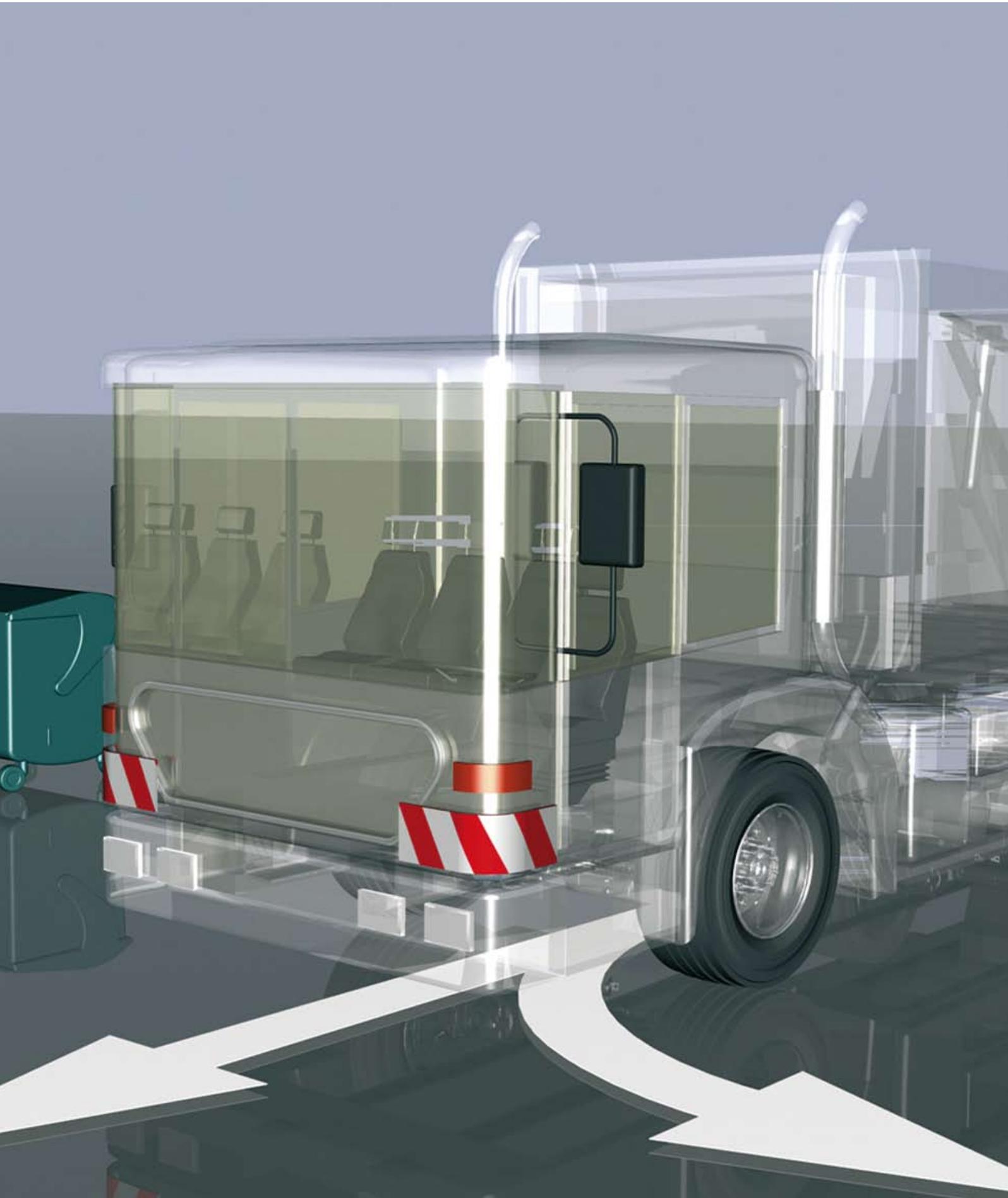
Features

- For controlling on-off and proportional solenoids
- With ramp function
- Command variables also as frequencies
- Programmable functions
- Analogue, digital signals
- Implementation of control circuits

Advantages

- Performance data tailor made for your particular application
- Perfectly tuned to hydraulics
- Suitable for many different system configurations

Model		Proportional Amplifiers	Analogue Control Units	Multi-functional Circuit Boards
Power outputs		1 - 4	1	1 - 5
Switched outputs		1 - 2	1	1 - 5
Variable Inputs		1 - 4	1 - 4	1 - 8
Application		Proportional solenoids	Prop. and on-off solenoids	Prop. and on-off solenoids
Voltage	V	12 - 30 DC	12 - 24 DC	12 - 30 DC



■ System Solutions

Our professional competence and the high performance reliability of Bucher Hydraulics' individual components have won worldwide recognition in the most varied of system solutions. We offer our customers valve manifolds and customized subsystems that can be used in a multitude of different application fields.





- System Solutions, Subsystems

Compact and energy efficient

- Fan Controls

Ideally matched with each other

Compact and energy efficient

System Solutions (Subsystems)



Features

- Valve manifolds available made of steel or aluminum
- Customized systems and components
- High degree of performance reliability and stability
- Customer oriented system solutions
- Optional with anti-corrosion treatment

Advantages

- Maximum performance in a minimum of space
- 100% performance tested
- Reduced pipe-work and assembly costs
- High power density

Model		Aluminium	Steel		Aluminium	Steel
Valves fitted		NG3 - NG16	NG3 - NG16		NG3 - NG16	NG3 - NG16
Operating pressure	bar	210	420	psi	3000	6000
Max. flow rate	l/min	350	350	gpm	92	92
Supply voltage	v	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC	v	12, 24 DC / 115, 230 AC	12, 24 DC / 115, 230 AC
Protection category	IP65 compliant with EN 60529					
Connector plug types	DIN/EN, Junior Timer radial and axial, Deutsch, free cable heads					

Ideally matched with each other

Fan Controls



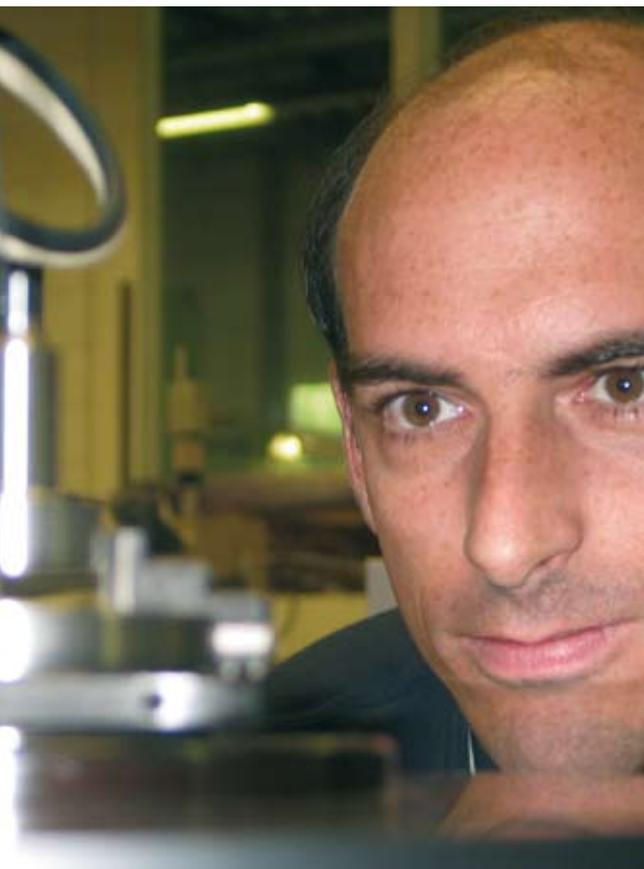
Features

- Consist of pump/motor based on either external or internal gear principle, valve technology and control electronics
- Construction kit principle with options such as:
 - Outrigger bearing for axial and radial power absorption
 - With anti-cavitation and pressure relief properties
 - Reversible
 - With proportional or thermostatic valve technology

Advantages

- Cooling circuit rapidly brought up to operating temperature
- Recognition and control of up to 3 actual values
- Failsafe function
- Reversible

Model		AP200	APFM200	QXM1		AP200	APFM200	QXM1
Displacement	cm ³ /rev	4.3 - 25.9	8.5 - 26	2.5 - 63	in ³ /rev	0.3 - 1.6	0.5 - 1.66	0.16 - 48
Max. continuous pressure	bar	190 - 220	190 - 220	210	psi	2700 - 3100	2700 - 3100	3000
Max. intermittent pressure	bar	210 - 250	220 - 250	250	psi	3000 - 3600	3100 - 3600	3600
Speed range	r/min	600 - 4000	600 - 4000	100 - 6500	r/min	600 - 4000	600 - 4000	100 - 6500
Hydraulic fluid temperature	°C	-15 to +80	-15 to +80	-25 to +80	°C	-15 to +80	-15 to +80	-15 to +80
Supply voltage	V	12 - 28 DC	12 - 28 DC	12 - 28 DC	V	12 - 28 DC	12 - 28 DC	12 - 28 DC



Bucher Hydraulics

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