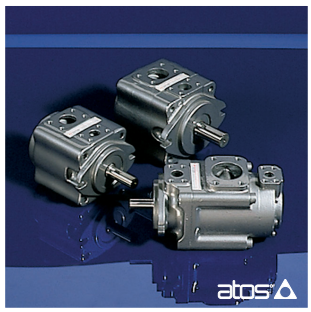
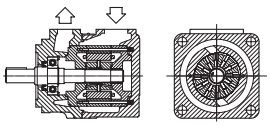
ATOS
ELECTRO-HYDRAULICS

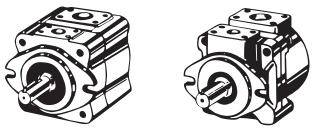
vane pumps



301 - PFE, PFED pumps

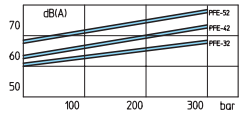


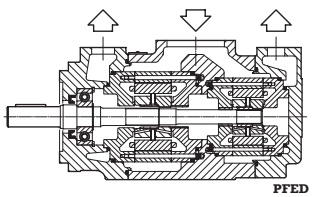
PFE



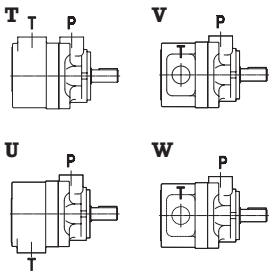
PFE-*2 PFE-*1

302 - PFE noise level at 1500 rpm





PFED



PFE vane pumps, fixed displacement

Cartridge design with integral hydraulic balancing, high performance, low noise level, high versatility and long service life.
Three basic models in standard execution or high pressure line plus further reduction of noise level.
Mounting according to ISO and SAE standard, full interchangeability of cartridges for maintenance and displacement fittings.
Displacement up to 150 cm³/rev, pressure up to 210 and 300 bar.
Following data refer to use with mineral oil, for other fluids information on request.

• **SINGLE VANE PUMPS**

PFE	–	31	036	/	1DU*
Vane pump, fixed displacement		Size and execution, see table 201 and 202	Displacement (cm³/rev), see table 201 and 202		Shaft, rotation and ports arrangement (1)

201 - Standard

Models	Pmax	Flow - l/min at 1500 rpm and		Power at 1500 rpm and Pmax	Max speed
		7 bar	140 bar		
	bar			kW	rpm
PFE-31016	210	23	19	8,3	2800
-31022	210	30	26	10,8	2800
-31028	210	40	36	14	2800
-31036	210	51	46	18	2800
-31044	210	63	58	22	2500
PFE-41045	210	64	60	23	2500
-41056	210	80	75	30	2500
-41070	210	101	95	35	2500
-41085	210	124	118	43	2000
PFE-51090	210	128	119	45	2200
-51110	210	157	147	55	2200
-51129	210	186	174	65	2200
-51150	210	215	204	80	1800

202 - High pressure, low noise

Models	Pmax	Flow - l/min at 1500 rpm and		Power at 1500 rpm and Pmax	Max speed
		7 bar	140 bar		
	bar			kW	rpm
PFE-32022	300	30	26	16	2500
-32028	300	40	36	20	2500
-32036	300	51	46	26	2500
PFE-42045	280	64	60	31	2200
-42056	280	80	75	40	2200
-42070	250	101	95	42	2200
-42085	210	124	118	43	2000
PFE-52090	250	128	119	54	2000
-52110	250	157	147	66	2000
-52129	250	186	174	78	2000
-52150	210	215	204	80	1800

Different cartridge displacements available on request

• **DOUBLE VANE PUMPS** - 2 cartridges into one body with common inlet port

PFED	–	43	070/022	/	*
One body double pump		Size: 43 or 54	Displacement of first and second PFE cartridge (cm³/rev) - see above		Shaft, rotation (1) and ports arrangement

203

Models	Composition	Pmax	Flow	Power	Max speed
		bar	l/min	kW	rpm
PFED-43 ***	whatever combination of PFE-41, -31 cartridges	210	see PFE table		
PFED-54 ***	whatever combination of PFE-51, -41 cartridges	210			

NOTES

(1) Options on the code
1.1 **Shaft** SAE-ISO 3019 (for other versions, see CDT catalogue or Atos internet site):
for PFE : 1 = standard keyed; 3 = high torque keyed;
for PVC : 1 = standard keyed;
1.2 **Rotation,** viewing pump at shaft end: D = clockwise, S = counterclockwise
1.3 **Ports** arrangement (P = outlet, T = inlet), see table at side

pumps

PVP axial piston pumps, variable displacement

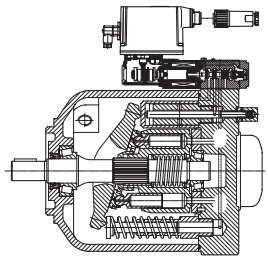
Axial piston pumps for industrial applications and high pressure operation with low noise level and long service life.
The variable displacement is obtained through the inclination of the swashing plate by means of an electrohydraulically driven servo-piston.
A line of hydraulic and electrohydraulic controls leads to energy-saving installation up to the SLER version which performs full proportional controls of flow and pressure in high dynamics.

303 - PVPC axial piston pumps

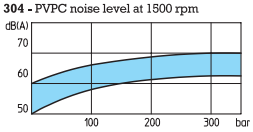
• AXIAL PISTON PUMPS - variable displacement

PVPC – SLER 4 046 / 1D

- PVPC: Axial piston variable displacement, C series
- SLER: Type of control
  C, R = manual, remote pressure compensator
  CH = manual pressure compensator, with venting
  CZ = proportional pressure compensator
  L = load sensing (pressure & flow)
  LW = constant power (mechanical)
  LZQZ = load sensing (pressure & flow proport. control)
  SL = closed loop proportional flow
  SLE = as SL option plus integral electronics (2)
  SLER = as SLE option plus sequence module (2)
  (2) Also available in integral digital execution (PES, PESR)
- 4: Size: 3, 4, 5, see table 204
- 046: Displacement (cm³/rev)
- 1D: Shaft, rotation



304 - PVPC noise level at 1500 rpm



204

Models	Displacement	Max pressure bar		Max flow at 1500 rpm	Power at 1500 rpm, max P and Q	Speed ratings
	cm³/rev	P_{max}	P_{peak}	l/min	kW	rpm
PVPC -*-3029	29	280	350	42	20	600 ÷ 3000
-*-4046	46	280	350	67	32	600 ÷ 2600
-*-5073	73	280	350	106	50	600 ÷ 2200

PFR radial piston pumps

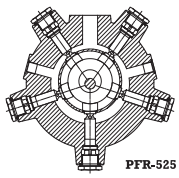
Fixed displacement, high pressure pumps for long service life in heavy duty applications.

205

Models	Pmax	Flow at 1500 rpm 250 bar	Power at 1500 rpm and Pmax	Max speed
	bar	l/min	kW	rpm
PFR-202	500	2,5	2,1	1800
-203	500	5,0	4,2	1800
PFR-308	350	12,5	7,5	1800
-311	350	16,5	10	1800
-315	350	21,5	12,5	1800

Models	Pmax	Flow at 1500 rpm 250 bar	Power at 1500 rpm and Pmax	Max speed
	bar	l/min	kW	rpm
PFR-518	350	26,0	15,2	1800
-522	350	31,5	18,4	1800
-525	350	37,0	21,6	1800

PFR-202



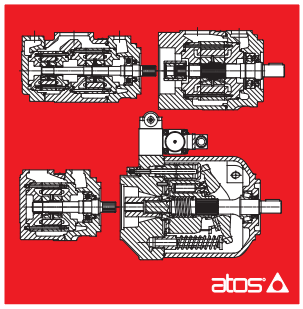
PFR-525

PFE, PVP, PFR multiple pumps

Multiple pumps are available by composition of PFE, PFR and PVP pumps.

PFE X 3 – 51090 / 31044/31044 *

- PFE: Multiple pump
- X: Number of elements
- 3: First element PFE, PVP, PFR
- 51090 / 31044/31044: Second/third element
- *: Shaft, rotation



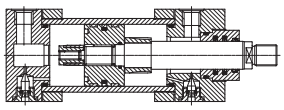
206

Models	Description
PFEX2*, PFEX3***	double and triple units: whatever combination of PFE pumps
PFEXD*	triple unit: whatever combination of PFE-5, -4 with PFED
PVP*X2E*	double unit: whatever combination of PVP with PFE pumps
PFRX2E*, PFRX3E***	double and triple units: whatever combination of PFR-3, PFR-5 with PFE
PFRXD*	triple unit: whatever combination of PFR-3, -5 with PFED

Composition subject to verification of max torque limit allowed by shaft

cylinders & servocylinders

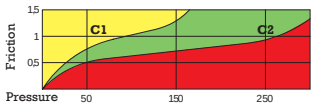
305 - CK cylinders



306 - CC cylinders

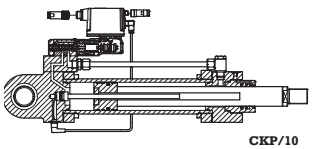
307 - Options of seals

Seals	Characteristics	Curve
1	High static and dynamic	C1
2	High fluid temperature	C2
4	High speed, up to 4 m/s	C2
6 / 7	Single effect-pushing/pulling	C2
8	Anti-friction	C2



308 - Options of cushioning

Position \ Type	Adjustable	Fixed
Rear	1	7
Front	2	8
Front & Rear	3	9



CKP/10

CK and CC series cylinders

CK are standard square head cylinders for nominal pressure up to 160 bar (max 250 bar), double acting with dimensions according to ISO 6020/2-91, DIN 24554 and AFNOR NFE 48-016.
CC are round head heavy duty cylinders, for nominal pressure up to 250 bar (max 320 bar), double acting with dimensions according to ISO 6022, DIN 24333, AFNOR-NFE 48-025, Cetop RP73H.
Bore diameters 25 to 400 mm, strokes up to 5 meters; pressure to 320 bar.

• HYDRAULIC CYLINDERS

CK - 63/45 * 0500 - S 0 0 1 *

- **CK** = ISO 6020/2, **CC** = ISO 6022
- Bore/rod diameter - mm (1)
- Stroke - mm
- Mounting style, see page 7
- Cushioning, see table 308
- Spacer (2)
- Seals, see table 307
- Options (3)

207 - CK standard range

Ø bore mm	Ø rod mm	Standard strokes mm
25	12, 18	25, 50, 100, 160, 200, 250, 320, 400, 500
32	14, 22	
40	18, 22, 28	
50	22, 28, 36	
63	28, 36, 45	
80	36, 45, 56	
100	45, 56, 70	
125	56, 70, 90	
160	70, 90, 110	
200	90, 140	

208 - CC standard range

Ø bore mm	Ø rod mm	Standard strokes mm
50	36	100, 250, 500, 1000
63	45	
80	56	
100	70	
125	90	
140	90	
160	110	
180	110	
200	140	
250	220	
320	220	
400	280	

NOTES

(1) Double rod cylinders available: add in the code the second rod diameter.
(2) Spacer: normally requested for stroke over 1000 mm to increase the rod guide and protect cylinder against overload and premature wear.
(3) Current options:
- incorporated ISO/Cetop subplates for assembling of control valves;
- end-stroke monitoring by inductive proximity switches;
- rod drain and air bleeds;
- customized end stroke cushionings, ports, rod end;
- NIKROM treatment, hardened and tempered steel.

• ELECTROHYDRAULIC SERVOCYLINDERS

Atos servocylinders feature high dynamic characteristics, they derive from standard cylinders plus low friction execution. These servocylinders may be supplied with potentiometric, inductive or magnetosonic built-in transducer, see on page 17.

CK P * – 63/45 * 0100 - X 008

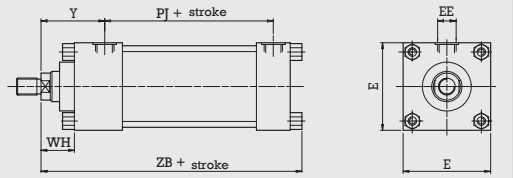
- Series type: **CK** = ISO 6020/2, **CC** = ISO 6022
- Transducer type: **P** = potentiometer, **V** = inductive, **F** = magnetosonic - analog, **M** = magnetosonic
- Option for incorporated subplate
- Bore/rod diameter - mm
- Coding as above

Cylinders electronic catalog

CDC electronic catalog for CK and CC cylinders, is a quick consultation tool designed for a simple and instinctive feeling. It allows:
- the guided selection of the cylinder code;
- the filling of a component list;
- the visualization of the selected cylinder:
  drawing can be saved as .DXF file and imported in a CAD system.

cylinders

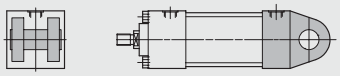
209 - CK cylinders - overall dimensions in mm



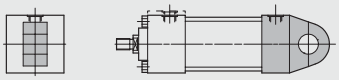
Basic configuration: **X**

Ø Bore	25	32	40	50	63	80	100	125	160	200
E	40	45	63	75	90	115	130	165	205	245
EE	1/4"	1/4"	3/8"	1/2"	1/2"	3/4"	3/4"	1"	1"	1 1/4"
PJ	53	56	73	74	80	93	101	117	130	165
WH	15	25	25	25	32	31	35	35	32	32
Y	50	60	62	67	71	77	82	86	86	98
ZB	121	137	166	176	185	212	225	260	279	336

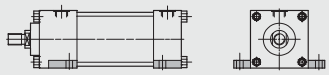
210 - CK cylinders - standard mounting execution



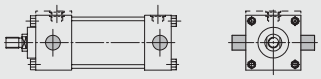
Female clevis: **C** (ISO MP1)



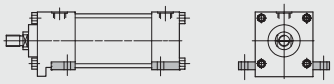
Male clevis: **D** (ISO MP3)



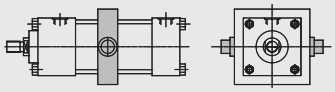
Feet: **E** (ISO MS2)



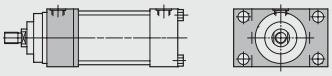
Front body-trunnion: **G** (ISO MT1)
Rear body-trunnion: **H** (ISO MT2)



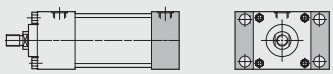
Feet with key: **K**



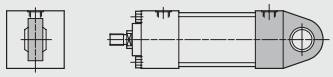
Mid-body trunnion: **L** (ISO MT4)



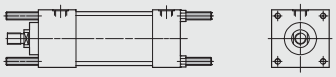
Front flange: **N** (ISO ME5)



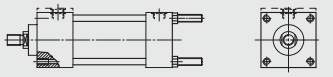
Rear flange: **P** (ISO ME6)



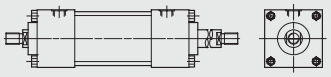
Swivel with eye: **S** (ISO MP5)



Extended tie rods: **V** (ISO MX2) rear
Y (ISO MX3) front
W (ISO MX1) front + rear

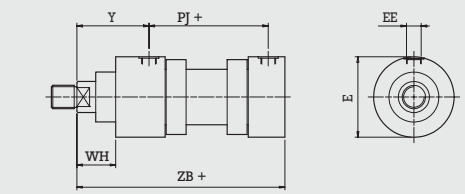


Front screwed holes: **Z** (ISO MX5)
Front screwed holes + extended tie rods: **T** (ISO MX7)



Basic configuration for double rod

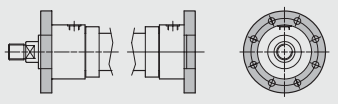
211 - CC cylinders - overall dimensions in mm



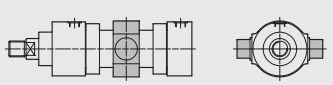
Basic configuration: **X**, or Front tapped holes: **Z**

Ø Bore	50	63	80	100	125	140	160	180	200	250	320	400
E	108	124	148	175	214	255	270	315	330	412	510	580
EE	1/2"	3/4"	3/4"	1"	1"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/2"	2"	2"
PJ	120	133	155	171	205	208	235	250	278	325	350	375
WF	47	53	60	68	76	76	85	95	101	113	136	163
Y	98	112	120	134	153	181	185	205	220	260	310	350
ZB	244	274	305	340	396	430	467	505	550	652	764	775

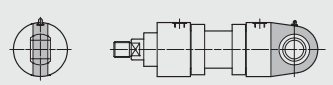
212 - CC cylinders - standard mounting execution



Flange: **A** (ISO MF3) front, **B** (ISO MF4) rear



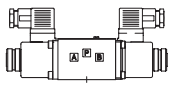
Mid-body trunnion: **L** (ISO MT4)



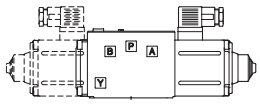
Swivel with eye: **S** (ISO MP5)

solenoid valves

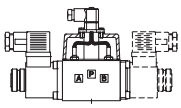
309 - DH, DK and DPH solenoid valves



DHU
DHI

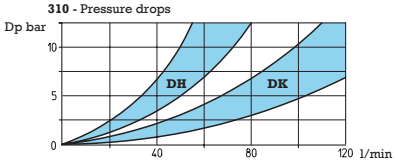


DKOR

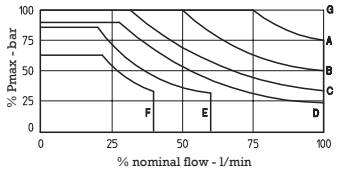


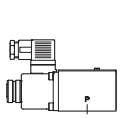
Safety valves type DH-FI

310 - Pressure drops

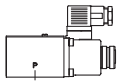


311 - Limits of use





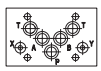
DLOH-2



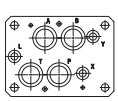
DLOH-3

216 - Subplate attachments: ISO 4401

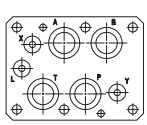
Size 06 - Cetop 03



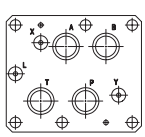
Size 10 - Cetop 05



Size 16 - Cetop 07



Size 25 - Cetop 08



Size 32 - Cetop 10

Atos is a leading international manufacturer of oil-hydraulic solenoid valves: many millions of Atos valves operate today worldwide.
Atos valves features: shell-moulding castings machined by transfer lines and then cleaned by thermic deburring – interchangeable spools – wet solenoids with manual override, manufactured and tested in-house to Atos quality standards.
Flow up to 1000 l/min – Pressure to 350 bar.

Standard valves are equipped with solenoids:

*I type suitable for AC and DC supply
*U type for DC supply with improved performance
*O type for DC supply with high performance

• DIRECT OPERATED SOLENOID VALVES

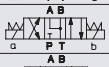
DHI - 0	63	1/2	/*	-	X	24DC	**
Size and solenoid DH*-0 = Size 06 DK*-1 = Size 10						Voltage supply (5)	Design number
Configuration, see 214					Without connector (4)		
Spool type (1)			Options (2)				

213 - Basic data

Model		DHI-0	DHU-0	DHO-0	DKI-1	DKU-1	DKOR-1
Nominal flow - l/min		60	60	80	100	100	120
Pmax - bar	P, A, B port	350	350	350	315	315	315
	T port	120	210	210	120 (*)	160 (*)	210 (*)
Electrical power DC		33 W	33 W	33 W	50 W	50 W	40 W
Electrical power AC		60 VA	-	-	110 VA	-	-

(*) Pressure up to 315 bar allowed if Y port is connected to tank

214 - Basic models **DHI, DHU, DHO, DKI, DKU, DKOR**

Symbol	Code	Performance for 4 way operation, see curves on diagrams 310, 311 solenoids *I	solenoids *U	solenoids *O	Code	Symbol
	- 631/2	B	A	A	-751/2	
	- 610	B	A	A	-710	
	- 611	B	A	A	-711	
	- 613	C	B	B	-713	
	-632/2	F	E	E	-714	

• ZERO LEAKAGE DIRECT OPERATED SOLENOID VALVE

DLOH	-	3	A	-	UX	24DC
Poppet type Size 06 (6)						Voltage supply (5)
Configuration: 2 = 2 way A = open in resting position 3 = 3 way C = closed in resting position					Without connector (4)	

215

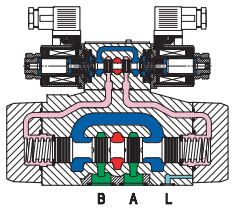
Model	DLOH-2A	DLOH-2C	DLOH-3A (6)	DLOH-3C (6)
Symbols				
Max flow - l/min	12			
Pmax - bar	350			

directional controls

• PILOT OPERATED SOLENOID VALVES

**DPHI - 2 | 71 | 7 | /* - X | 24DC | **

- DPHI - 2: Size and solenoid
  DPH*-1 = Size 10
  DPH*-2 = Size 16
  DPH*-3 = Size 25
  DPH*-6 = Size 32
- 71: Configuration, see 217
- 7: Spool type (1)
- /*: Options (3)
- X: Without connector (4)
- 24DC: Voltage supply (5)
- **: Design number

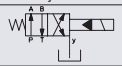
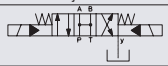
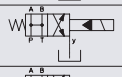
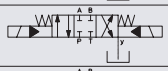
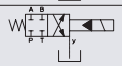
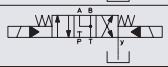


312 – DPHI-27 pilot operated solenoid valve

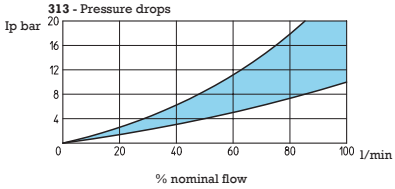
217 - Basic data

Model		DPH*-1	DPH*-2	DPH*-3	DPH*-6
Nominal flow - l/min		140	300	650	1000
Pmax - bar	P, A, B X port	350	350	350	350
	T port	250	250	250	250
Electrical power DC		See table 213 - pilot valve DHI/DHU/DHO			

218 - Basic models **DPHI, DPHU, DPHO**

Symbol	Code	Symbol	Code
	- 631		-710
	- 610		- 711
	- 611		- 713
			- 714

313 - Pressure drops

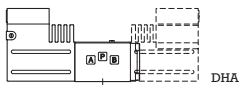


• SOLENOID VALVES FOR SPECIAL APPLICATIONS

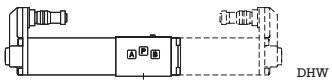
219

Specification	Code	Max flow l/min	Pmax bar
Explosion-proof to ATEX CE EX II 2G	**DHA - 0; DLOH-AO**	70	350
Explosion-proof to UL, Class I, Groups C&D	**DHA-0/UL; DLOH-AO/UL**	70	350
Intrinsically safety to ATEX CE EX II 1G	**DHW-0**	20	210

Ex-proof and intrisically safe executions are also available for pilot operated constructions.
Proportional ex-proof valves with or without electronic transducer - see CDT catalog or Atos Internet site.



DHA



DHW

• LEVER & MECHANICAL OPERATED DIRECTIONAL VALVES

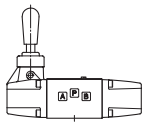
DH - 0 | 1 | 1 1

- DH - 0: Size and solenoid
  DH-0 = Size 06
  DK-1 = Size 10
- 1: Operation:
  1 = lever
  2 = cam
- 1 1: Configuration and spool

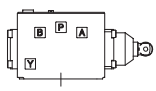
220 - Basic models - nominal flow and Pmax as solenoid valves, see table 213

Spring return		With detent		Symbols see table 214
Size 06 - Cetop 03	Size 10 - Cetop 05	Size 06 - Cetop 03	Size 10 - Cetop 05	
DH-0131	**DK-1131**	**DH-0151**	**DK-1151**	
DH-0110 **-0111** **-0113** **-0114**	**DK-1110** **-1111** **-1113** **-1114**	**DH-0140** **-0141** **-0143** **-0144**	**DK-1140** **-1141** **-1144**	
DH-0231/2	**DK-1231/2**			

In the table are shown the preferred executions. Other standard configurations are currently available.



DH-0***



DK-12

NOTES

(1) Spools are interchangeable; different configurations are normally available (damped switching, low leakage, specific port connection)
(2) Options:
A = solenoid mounted at side of port B (only for single solenoid valves)
WP = prolonged manual override protected by rubber cap
L1, L2, L3 = device for controlling the switching times
F* = safety options with spool position detector:
FC = mechanical microswitch
FI = inductive proximity
(3) Main options for pilot operated valves:
H = pilot chokes – adjustable control of shifting time
M = pressure centering
R = check-valve in P
S = main spool stroke limiter
(4) Electric connectors conform to standard DIN 43650 to be ordered separately:
SP-666 = standard, IP 65
SP-669 = with built-in rectifier for AC supply on DC coils.
Electronic connectors for higher performances or PLC interfacing, see CDT catalog or Atos Internet site.
(5) Standard voltages, other voltages available on request:
VDC: 6, 12, 14, 24, 28, 48
VRC: 110, 230
VAC: 110, 230 50/60 Hz; 120, 230 60 Hz.
(6) High performances DLOK valves (Size 06) are available on request (Flow up to 24 l/min - Pmax 315 bar).

conventional valves

314 - conventional valves

A full line of pressure, flow and directional controls in different executions:

Pressure controls
subplate and threaded mounting – relief, sequence, unloading and reducing.

Flow controls
pressure compensated, subplate mounting.

Modular valves
modular mounting - relief, sequence, reducing, check, flow control valves and pressure compensators.

Check valves
subplate and threaded mounting – direct and pilot operated.

• PRESSURE CONTROLS

AGA **M - 20 /10 / 210 ***

ARE, ARA= in-line, threaded port
AGA = subplate, pattern form R
AGI = subplate, pattern form P

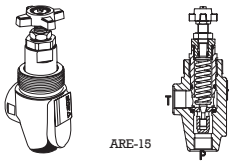
Only for ARA and AGA:
M = relief
Only for AGI:
R = reducing
S = sequence
U = unloading

Size:
06, 15 for ARE
20, 32 for ARA
10, 20, 32 for AGA and AGI

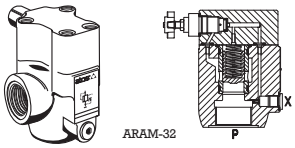
Venting or multiple pressure settings (1)

Pressure range:
100 = 6 ÷ 100 bar
210 = 7 ÷ 210 bar
350 = 8 ÷ 350 bar

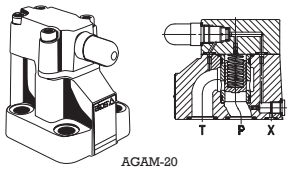
Options and electrical data



ARE-15



ARAM-32



AGAM-20

221 - In-line model

	Model		Variant with venting (1)		Size	Qmax-l/min	Pmax - bar
Relief	ARE-06 (2)		-		G 1/4"	40	350, 500
	ARE-15 (2)		-		G 1/2"	75	15, 50, 75, 150, 250
	ARAM-20		ARAM-20/10		G 3/4"	350	50, 100, 210, 350
	ARAM-32		ARAM-32/10		G 1 1/4"	500	

222 - Subplate model

	Model		Variant with venting (1)		Size	Qmax-l/min	Pmax - bar
Relief	AGAM-10		AGAM-10/10		10	200	50, 100, 210, 350
	AGAM-20		AGAM-20/10		25	400	
	AGAM-32		AGAM-32/10		32	600	
Unloading	AGIU-10		AGIU-10/10		10	100	100, 210, 350
	AGIU-20		AGIU-20/10		25	200	
	AGIU-32		AGIU-32/10		32	300	

	Model		Variant with check valve		Size	Qmax-l/min	Pmax - bar
Sequence	AGIS-10		AGISR-10		10	200	100, 210, 350
	AGIS-20		AGISR-20		25	400	
	AGIS-32		AGISR-32		32	600	
Reducing	AGIR-10		AGIRR-10		10	160	50, 100, 210, 350
	AGIR-20		AGIRR-20		25	300	
	AGIR-32		AGIRR-32		32	400	

• FLOW CONTROLS, PRESSURE COMPENSATED

QV - 10 / 3 / *

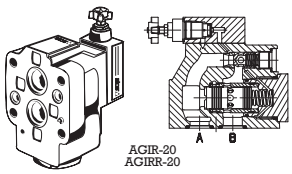
Pressure compensated flow control valve

Size:
06 = Size 06
10 = Size 10
20 = Size 20

Size 06
maximum adjustable flow rate:
1, 6, 11, 15, 24

Size 10, 20
2 = two-way valves
3 = three-way valves

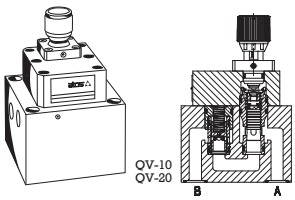
Options



AGIR-20
AGIRR-20

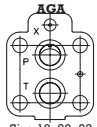
223

2-way models		Qmax - l/min	Pmax - bar	3-way models		Qmax - l/min	Pmax - bar
QV-06		1, 6, 11, 16, 24	250	-		-	250
QV-10/2		60	250	QV-10/3		60	250
QV-20/2		160	250	QV-20/3		180	250

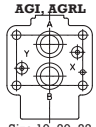


QV-10
QV-20

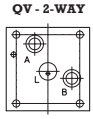
224 - Subplate attachments: ISO 6264, 5781, 6263



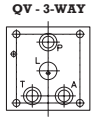
AGA
Size 10, 20, 32
Cetop 06R, 08R, 10R



AGI, AGRL
Size 10, 20, 32
Cetop 06P, 08P, 10P



QV - 2-WAY
Size 10, 20
Cetop 06-2, 07-2



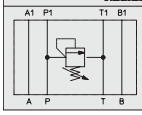
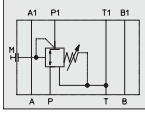
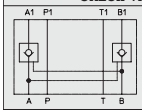
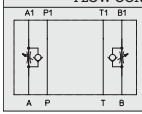
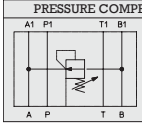
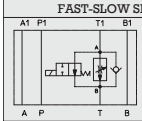
QV - 3-WAY
Size 10, 20
Cetop 06-3, 07-3

modular valves

• MODULAR VALVES

H	M-0	12	210
Size: H...0 = Size 06 K...0 = Size 10 JP...2 = Size 16 JP...3 = Size 25			Pressure adjustment, see pressure control at page 10 and/or options (3)
Operation, see 225		Function (4)	

225

Operation and symbols		Size 06		Size 10		Size 16
RELIEF		Direct op.	Pilot op.	Direct op.	Pilot op.	Pilot op.
	Qmax-l/min	35	50	100		
	Pmax-bar	350		350		
		HMP -011 -012 -013 -014 -015	**HM -011 -012 -013 -014 -015**	**X**	**KM -011 -012 -013 -014 -015**	**X**
PRESSURE REDUCING		3-way		3-way		2-way
		Direct op.	Pilot op.	Direct op.	Pilot op.	Pilot op.
	Qmax-l/min	40		80		250
	Pmax-bar	210		210		210
		HG -031 -033 -034	**X**	**X**	**KG -031 -033 -034**	**JPG-211**
CHECK-VALVE		Direct op.	Pilot op.	Direct op.	Pilot op.	Pilot op.
	Qmax-l/min	50		100		160
	Pmax-bar	350		315		350
		HR -011 -016	**HR -012 -013 -014**	**KR -011 -016**	**KR -012 -013 -014**	**JPR-212 -213 -214**
FLOW CONTROL		meter-out	meter-in	meter-out	meter-in	meter-out
	Qmax-l/min	50		100		160
	Pmax-bar	350		315		315
		HQ-012 -013 -014	**HQ -022 -023 -024**	**KQ-012 -013 -014**	**KQ -022 -023 -024**	**JPQ -212 -213 -214**
PRESSURE COMPENSATOR (5)						
	Qmax-l/min	50		100		200
	Pmax-bar	350		350		350
		HC-011/8 HC-011/30		**KC-011/30**		**JPC-211/30**
FAST-SLOW SPEED (*)		meter-out	meter-in	meter-out	meter-in	
	Qmax-l/min	36		75		
	Pmax-bar	250		250		
		DHQ-016 DHQ-013	**DHQ-011 DHQ-023**	**DKQ-016 DKQ-013**	**DKQ-011 DKQ-023**	**X**

(*) Slow speed with solenoid energized (/O) or de-energized (/C)

• CHECK VALVES

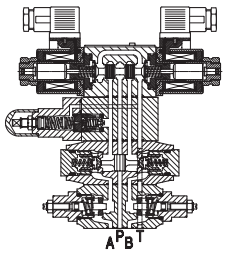
226 - In-line model: Pmax 400 bar

	Model	Threaded ports	Max flow - l/min
check only	**ADR-06, 10, 15**	G 1/4", G 3/8", G 1/2"	40, 80, 150,
	ADR-20, 25, 32	G 3/4", G 1", G 1 1/4"	300, 360, 500
check & pilot reverse opening	**ADRL-10, 15, 20, 32**	G 3/8", G 1/2", G 3/4", G 1 1/4"	30, 60, 100, 300
throttle with integral check	**AQFR-10, 15, 20, 25, 32**	G 3/8", G 1/2", G 3/4", G 1", G 1 1/4"	30, 50, 80, 160, 250

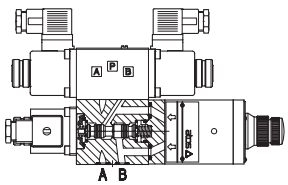
227 - Subplate model: Pmax 315 bar

	Model	Size (see tab. 224)	Max flow - l/min
check & pilot reverse opening	**AGRL-10, 20, 32**	10, 25, 32	160, 300, 500
as above with external drain	**AGRLE-10, 20, 32**		

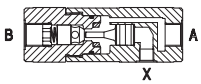
315 - modular valves



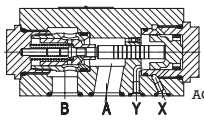
316 - DHI-07 + HM-011 + HR-012 + HQ-012



317 - DHQ + DHI-07



ADRL-15



AGRL-20

NOTES

(1) Electrically operated versions are available for AGAM, ARAM and AGIU
(2) The internal cartridges are also available as separated components for simplifying the installation in the manifolds:
CART M-6 (for ARE-06)
CART ARE-15 (for ARE-15).
(3) V = handwheel for pressure control valves.
2 = cracking pressure spring value (bar) for check-valves; available springs: 2, 4, 8 bar instead of 1 bar standard spring.
G = micrometric adjustment for flow control valves;
D = KR-012, -013, -014 only: pre-opening of poppet.
(4) Suffixes indicate ports of subplate where valve operation is effective
011 = on P port;
012 = on A and B port;
013 = on A port only;
014 = on B port only;
015 = only for relief valves, on A and B port with crossed discharge;
016 = on T port only;
022, 023, 024 = only for flow controls, as 012, 013, 014 but control of flow entering the actuator;
031, 033, 034 = only for pressure reducing controls, as 011, 013, 014;
(5) Option /8 = fixed @p (8 bar); option /30 = adjustable @p (5 -35 bar).

cartridge valves

318 - cartridges

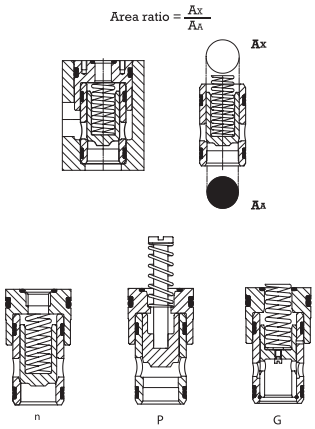
Cartridge valves are located in ISO standard cavities on functional blocks having proper hydraulic connections.

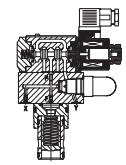
They are composed by a poppet or spool cartridge and by a functional cover that retains the cartridge and provides internal hydraulic piloting.

Pressure, flow and directional controls with on-off or proportional execution according to the modular composition of functional covers.

ISO sizes: 16, 25, 32, 40, 50, 63, 80.

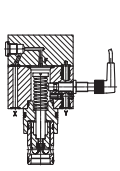
Flow up to 5000 l/min, pressure up to 350 bar.



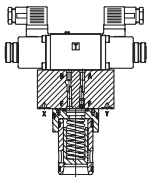


LIMH-2
SC LI-2531*

LIDD-2



LIDA-2/F
LIFI-2563



LIDEW-3*
SC LI-3232*

NOTES

(1) Sizes up to NG63 (3000 l/min) and NG80 (5000 l/min) are available on request.
(2) Cracking pressure:
1 = 0,3 bar; 2 = 1,5 bar; 3 = 3 bar; 4 = 4 bar
(3) Safety options are available in modular covers coupled with proper cartridges. Mechanical microswitch (LIFC cartridge code) or inductive proximity sensor (LIFI cartridge code) can be selected as detective element.
(4) Table shows basic models, other configurations are available.
(5) Option B: cartridge valve piloted via port B of solenoid valve.

• CARTRIDGE ELEMENTS

SC LI	–	16	32	1
LI = ISO 7368				Spring type (2)
Size (1): NG 16, 25, 32, 40, 50			Cartridge type	

228 - Qmax at 2p = 6 bar

Size	NG 16	NG 25	NG 32	NG 40	NG 50
Pressure control	200	400	600	1200	2000
Flow control	60 - 180	400	600	1200	2000
Directional control	180	400	600	1200	2000
Check control	180	400	600	1200	2000

229 - Cartridges (3)

Control (4)		Area ratio	Model	Notes
Directional and check	n	1 : 1,1	SC LI -**-32*	
Directional and check	n	1 : 2	SC LI -**-33*	
Pressure and 3-way compensator	n	1 : 1	SC LI -**-31*	
			SC LI -**-36*	Smooth operation
Pressure and direction normally open	P	1 : 1,1	SC LI -**-62*	
			SC LI -**-63*	Smooth operation
Pressure and direction normally open	G	1 : 1	SC LI -**-37*	

• FUNCTIONAL COVERS

LI	MHA	–	2	/	210	–	IX 24DC	** /*	X**
Cover according to ISO 7368								Options	
Functions, see 230							Pilot solenoid valve options		
Size: **1** = NG16; **2** = NG25; **3** = NG32; **4** = NG40 **5** = NG50;					Only for pressure type LIM-LIRA pressure range control: 100, 210, 350				

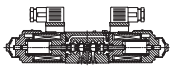
230 - Typical functions of covers (3)

Function (4)	Hydraulic sketch	Function (4)	Hydraulic sketch
LIMM Pressure relief **LIRA** Pressure reducing	LIMM	**LIMH A** **LIMH C** As LIMM plus venting: unloading when solenoid is energized (**A**) or de-energized (**C**)	LIMH*
LIDD Flow control with stroke limiter	LIDD	**LIDA:** Check valve normally closed **LIDO:** Check valve normally open **LIDR:** Check valve pilot operated **LIDB:** Check valve with shuttle valve for pilot selection	LIDR
LIDBH*A (5) **LIDBH*C** Directional control with solenoid and shuttle valve for pilot selection. Open (**A**) or closed (**C**) when solenoid is de-energized	LIDHB1*	**LIDEW** (5) Directional control with solenoid valve for pilot selection with 6 different configuration	LIDEW

proportional controls

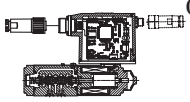
Proportional valves modulate hydraulic or motion parameters according to electronic reference signals.
Atos, a leader in pioneering electrohydraulics, offers today one of the most advanced lines of proportional valves which allow similar or better performances in comparison with servovalves whilst maintaining the typical benefits of proportional electrohydraulics: less sensitivity, coarser filtration requirements, intrinsic stability, easier servicing and lower cost.

The wide range of Atos proportionals is equipped by exclusive solenoids in the following versions:

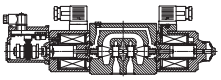


ZO-A; ZOR-A
Efficient open loop solenoids, 35 W, designed for direct-acting valves ISO/Cetop 03 and 05 respectively

(-AES)

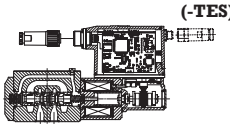


ZO-AE; ZOR-AE
As ZO-A plus integral electronic driver, analog or digital (S)



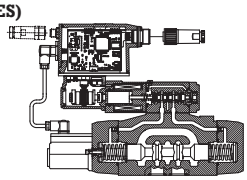
ZO-T; ZOR-T
Closed loop solenoids with integral electronic transducer to feedback the spool position, featuring high performances

(-TES)

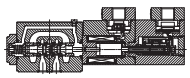


ZO-TE; ZOR-TE
As ZO-T plus integral analog or digital (S) electronic driver, in closed loop, preset to ensure valve-to-valve interchangeability and easier set-up

(-LES)



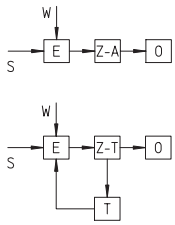
ZO-LE
For high-performance 2-stage valves, with analog or digital (S) electronic driver preset in double closed loop



ZA-T (ZA-A)
Explosion-proof safety solenoids classified according to Cenelec or UL standards in closed loop (ZA-T) or in open loop (ZA-A) execution

319 - proportional valves

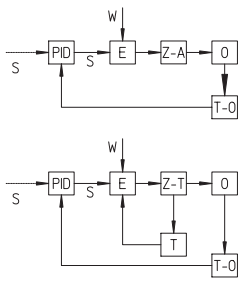
OPEN LOOP



LEGEND

W	= DC power
S	= reference signals
Z-A, -T	= valves respectively in -A or -T configuration
E	= electronic driver
T	= valve transducer
T-O	= system transducer
O	= actuation system
PID	= axis controller

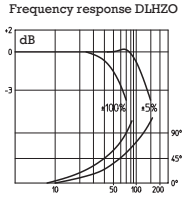
CLOSED LOOP



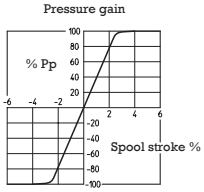
231 - Typical characteristics of Atos proportional directional valves

Size	Valve version	06	10	16	25
Hysteresis	-A, -AE -T, -TE	5% 0,1%	5% 0,1%	5% 0,1%	5% 0,1%
Response time stroke 0-100%	-A, -AE -T, -TE	20 . . . 30 msec 8 . . . 15 msec	25 . . . 40 msec 10 . . . 20 msec	50 . . . 70 msec 20 . . . 35 msec	60 . . . 80 msec 25 . . . 45 msec
Pressure gain *40,*60 versions	-A, -AE -T, -TE	2 . . . 5%	2 . . . 5%	3 . . . 6%	3 . . . 6%
Frequency response ± 100% at -3dB, 90° phase lag ± 5%	-T, -TE	@ 50 Hz @130 Hz	@ 40 Hz @100 Hz	@30 Hz @80 Hz	@25 Hz @70 Hz

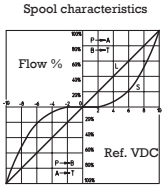
Frequency response DLHZO



Pressure gain



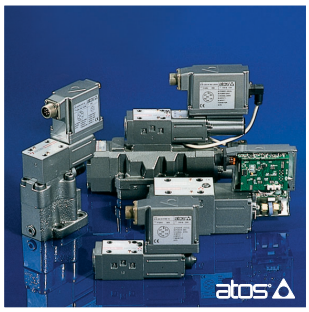
Spool characteristics



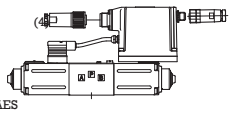
• GENERAL INFORMATION

- Valves operation is optimized by Atos electronic drivers with factory preset calibration.
- Digital electronics are provided with serial or fieldbus (Can-bus, Profibus) connections.
- Simple adjustments at start up may be required for –A, -T valves, no further adjustments are required for AE(S), –TE(S) and LE(S) valves.
- Recommended fluid contamination according to ISO 18/15, absolute filtration 10 µ, β10 @75.

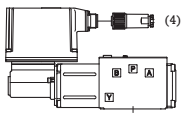
proportional controls



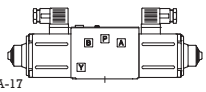
320 - proportional valves



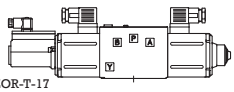
DHZO-AES



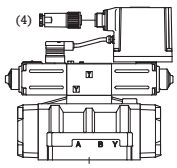
DLKZOR-TE



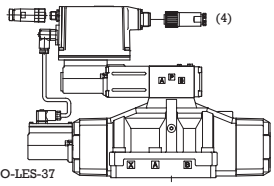
DKZOR-A-17



DKZOR-T-17



DPZO-AE-27



DPZO-LES-37

• PROPORTIONAL DIRECTIONAL VALVES

DLK ZOR – TE – 1 40 L73 / *

- DLK: Model, size and ISO/Cetop subplate mounting (1)
  DH, DLH = Size 06
  DK, DLK = Size 10
  DP = Size 10, 16, 25
- ZOR: Solenoid type ZO, ZOR
- TE: Execution according to use:
  A = without integral transducer
  AE = as A with integral electronics
  AES = as A with digital integral electronics
  T = with integral spool position transducer
  TE = as T with integral electronics
  TES = as T with digital integral electronics
  L = with two integral position transducers
  LE = as L with integral electronics
  LES = as L with digital integral electronics
- 1: Size (1):
  0 = 06 (Cetop 03)
  1 = 10 (Cetop 05)
  2 = 16 (Cetop 07)
  3 = 25 (Cetop 08)
- 40: Configuration and spool overlapping (2)
- L73: Spool type (3)
- /: Options (11)
- *

232 - DIRECT OPERATED VALVES

Symbols	Size	Models	Execution -A -AE -AES	Execution -T -TE -TES	Spools (3)	Flow-l/min at 6p bar (5) 30	70	Max
*40	06	DLHZO-*-040 (6)	X	I	L13	4,5	7	18
					L33	9	14	32
					L53	18	28	50
					L73	27	40	70
*40					T73	27	40	70
	10	DLKZOR-*-140 (6)	X	I	L33	40	60	90
					L73	60	100	160
*71					T73	60	100	160
	06	DHZO-*- 071	I	I	S3	30	45	60
					S5	50	70	85
*73		073	I	I	L1	8	12	18
		(7) 051	I	I	L3	30	45	60
		053	I	I	L5	50	70	85
					D5	50	70	85
*51	10	DKZOR-*- 171	I	I	S3	80	120	140
					S5	130	170	180
		173	I	I	L3	80	120	140
		151	I	I	L5	130	170	180
*53		153	I	I	D5	130	170	180

233 - PILOT OPERATED VALVES (8)

Symbols	Size	Models	Execution (8) -A -AE -AES	Execution (8) -T -TE	Execution (8) -L -LE -LES	Spools (3)	Flow-l/min at 6p bar (5) 10	30	Max
*71	10	DPZO-*- 17*	I	I	I	S5	80	135	170
		15*	I	I	I	L5	80	135	170
*73		160	X	X	I	D5	80	135	170
		170	X	X	I				
*51	16	DPZO-*- 27*	I	I	I	S3	130	220	440
		25*	I	I	I	S5	200	340	770
*53		260	X	X	I	L5	200	340	770
		270	X	X	I	D5	200	340	770
*60	25	DPZO-*- 37*	I	I	I	S5	360	620	1450
		35*	I	I	I	L5	390	680	1450
*70		360	X	X	I	D5	360	620	1450
		370	X	X	I				

NOTES

(1) Pmax 350 bar, 315 bar for size 10.
(2) 0 = zero overlapping; 1 = positive; 3 = P positive, A, B, T negative
(3) Regulation options according to table 232 and 233:
L = linear; S = progressive; T = linear with double hydraulic gain;
D = as S but A, B flow paths have ratio 1:2.
Other spools configuration are available on request
(4) The 7-pins connector, in plastic (SP-ZH-7P) or metallic (SP-ZM-7P) execution, must be ordered separately.
(5) Flows for max electronic signal at total 6p across the valve (each flow path accounting for about a half).
(6) Fail safe configuration can be:
• with port P closed, ports A, B, T connected to tank (first sketch) spools code L13, L33, L53, L73, T73
• with all ports closed (second sketch) spools code L11, L31, L51, L71, T71;
(7) DHZO-A-060 version, single solenoid with 2 external position, spring offset and zero overlapping is available on request.

proportionals

• PROPORTIONAL THROTTLE CARTRIDGES, PRESSURE OR FLOW CONTROL VALVES

RZM **O – A – 10 / 350**

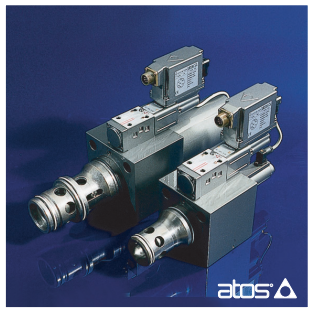
Type:
RZM, AGMZ= relief - subplate mounting
LIMZ = relief - cartridge
HZM = relief - modular mounting
RZG, AGRZ = reducing - subplate mount.
LIRZ = reducing - cartridge
HZG, KZG = reducing - modular mounting
QV*Z = compensated - subplate mounting
LIQZ = throttle cartridges

Solenoid type ZO, ZOR

Size

Max pressure or variants for operation

Execution according to use:
A = for open or closed loop control, without integral transducer
AE = as A with integral electronics (not for QVMZO)
AES = as A with digital integral electronics
L = with double integral position transducer
LE = as L plus integral electronics
LES = as L plus integral digital electronics
TER = with integral pressure transducer and electronics
TERS = with integral pressure transducer and digital electronics



321 - proportional cartridges

234 - PRESSURE CONTROLS – Relief and reducing – Pmax 315 bar

Symbols	Size	Models	Execution			Max flow l/min	Symbols	Size	Models	Execution			Max flow l/min
		Relief	-A	-AE -AES	-TER -TERS				**Reducing**	-A	-AE -AES	-TER -TERS	
	06	**RZMO-*- 010**	I	I	I	6		06	**RZGO-* - 010**	I	I	I	12
		- 030	I	I	I	40			**- 033**	I	I	I	40
	06	**HZMO-*- 030**	I	**X**	**X**	40		06	**HZGO-* - 031**	I	**X**	**X**	40
								10	**KZGO-* - 031**	I	**X**	**X**	100
	10	**AGMZO-* - 10**	I	I	I	200		10	**AGRZO-* - 10**	I	I	I	160
	25	**- 20**	I	I	I	400		25	**- 20**	I	I	I	300
	32	**- 32**	I	I	I	600							
	NG16	**LIMZO-* -1**	I	I	I	200		NG16	**LIRZO-* -1**	I	I	I	160
	NG25	**-2**	I	I	I	400		NG25	**-2**	I	I	I	320
	NG32	**-3**	I	I	I	750		NG32	**-3**	I	I	I	600

(4) RZMO-AE-010

KZGO-A

(4) AGMZO-TERS-20

235 - FLOW CONTROLS, pressure compensated - Two or three ways – Pmax 250 bar, 210 for QVHZO and QVKZOR

Symbols	Size	Models	Execution		Max flow l/min	Symbols	Size	Models	Execution			Max flow l/min
		2-way valves	-A -AE -AES	-T -TE -TES				**3-way** valves	-A	-AE -AES	-T -TE -TES	
	06	**QVHZO-*- 06**	I	I	3,5-45		06	**QVHZO-*- 06**	I	I	I	3,5-45
	10	**QVKZOR-* - 10**	I	I	65-90		10	**QVKZOR-* - 10**	I	I	I	65-90
	10	**QVZO-* - 10/2**	I	**X**	60		10	**QVZO-* - 10/3**	I	I	**X**	70
	16	**- 20/2**	I	**X**	135		16	**- 20/3**	I	I	**X**	150
							16	**QVMZO-* - 20/3**	I	**X**	**X**	170
							25	**- 32/3**	I	**X**	**X**	280

(4) LIRZO-AE-25

236 - THROTTLE CARTRIDGES (9) - Two or three way – Pmax 315 bar

Symbols	Size	Models (10)	Execution		Max flow l/min at >p 5 bar	Symbols	Size	Models (10)	Execution		Max flow l/min at >p 5 bar
		2-way valves	-T -TE -TES	-L -LE -LES				**3-way** valves	-T -TE -TES	-L -LE -LES	
LIQZO-T*	NG16	**LIQZO-*-162L4**	I	I	250						
	NG25	**-252L4**	I	I	500	LIQZO-L*3	NG25	**LIQZO-*-253L4**	**X**	I	185
	NG32	**-322L4**	I	I	800		NG32	**-323L4**	**X**	I	330
LIQZO-L*2	NG40	**-402L4**	I	I	1200		NG40	**-403L4**	**X**	I	450
	NG50	**-502L4**	I	I	2000		NG50	**-503L4**	**X**	I	780

(4) QVKZOR-TE

(4) LIQZO-LES-40

NOTES

(8) On pilot operated valves DPZO, the code -T, -TE, means one integral transducer on the main spool while the code -L, -LE, -LES means two integral transducers on the main and pilot spools (high dynamics versions).
(9) Codes refer to cartridge plus functional cover.
(10) Sizes up to NG63 and NG80 are available on request.
(11) Option /B is available, with solenoid/transducer/electronics mounted at opposite side of the body.

electronics

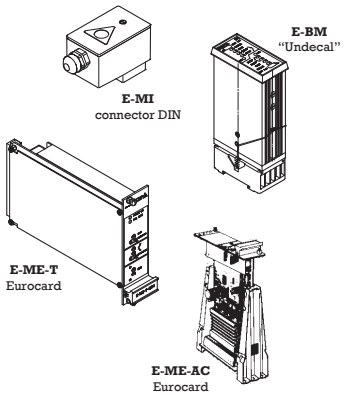
322 - electronics

Atos electronics includes analog and digital drivers which supply proportional valves with a proper PWM current to align valve regulation to the reference signal.

Atos electronics has a CE marking qualifying the conformity to the EMC – Electromagnetic Compatibility European Directive.

237 - PLUG-IN, UNDECAL, EUROCARD DRIVERS

Models	For valves with	Execution (1)	Max power supply (2)	Driver response	Reference signals (3) (4)
E-MI-AC-01F (5)	1 Solenoid ZO(R)-A	I	40W	normal	C, (A)
E-BM-AC-01F		B	50W	fast	V, C
E-ME-AC-01F		E	50W	fast	V, C, (A)
E-ME-T-01H	1 Solenoid ZO(R)-T	E	50W	high performance	V, C, (A)
E-ME-L-01H	1 Solenoid ZO(R)-T plus separate transducer	E	50W	high performance	V, C, (A)
E-BM-AC-05F	2 Solenoids ZO(R)-A	B	50W	fast	V
E-ME-AC-05F		E	50W	fast	V, C, (A)
E-ME-T-05H	2 Solenoids: ZO(R)-T + ZO(R)-A	E	50W	high performance	V, (A)



INTEGRAL ANALOGIC OR DIGITAL DRIVERS

The integral electronics, factory preset, ensure fine functionality plus valve-to-valve interchangeability and simplifies installation wiring and system set-up.

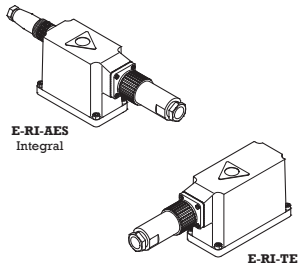
238 - Analog executions

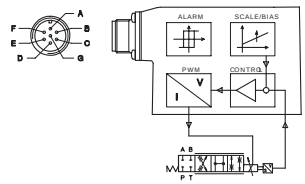
Models	For valves with	Execution (1)	Max power supply (2)	Driver response	Reference signals (3) (4)
E-RI-AE-01F	1 Solenoid ZO(R)-A	X	50 W	fast	C, (A)
E-RI-AE-05F	2 Solenoid ZO(R)-A	X	50 W	fast	V, (A)
E-RI-TE-01H	1 Solenoid ZO(R)-T	X	50W	high performance	V, C, (A)
E-RI-LE-01H	1 Solenoid ZO(R)-T plus separate transducer	X	50W	high performance	V, C, (A)
E-RI-TE-05H	2 Solenoids: ZO(R)-T + ZO(R)-A	X	50W	high performance	V, (A)

New digital integral drivers, see page 17, have the same functions, connectors and dimensions of analog drivers, plus adding the typical benefits of digital electronics. Software setting is provided via rear connector.

239 - Digital executions

Models	For valves with	Execution (1)	Max power supply (2)	Driver response	Reference signals (3) (4)
E-RI-AES-01H	1 Solenoid ZO(R)-A	X	50 W	high performance	C, (A)
E-RI-AES-05H	2 Solenoid ZO(R)-A	X	50 W	high performance	V, (A)
E-RI-TES-01H	1 Solenoid ZO(R)-T	X	50 W	high performance	V, C, (A)
E-RI-LES-01H	1 Solenoid ZO(R)-T plus separate transducer	X	50 W	high performance	V, C, (A)
E-RI-TES-05H	2 Solenoids: ZO(R)-T + ZO(R)-A	X	50 W	high performance	V, (A)





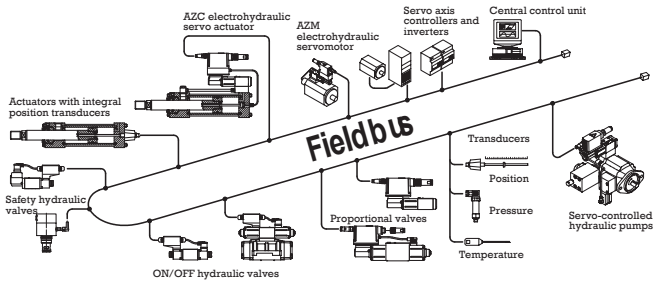
323 - **E-RI** integral driver with 7-poles connector:

A = power supply 24 VDC
B = power supply zero
C = signal zero
D = input +
E = input –
F = monitor signal
G = earth

• DIGITAL ELECTROHYDRAULICS WITH FIELDBUS INTERFACE

Electrohydraulic systems may be integrated in field communication network, usually called fieldbus, i.e. CAN-Bus, Profibus, etc.

The fieldbus connects valves, pumps, sensors, switches, transducers, motors, actuators and other devices: an advanced solution for modern machines, that allows easier wiring in multi-axis systems plus fault-diagnostics.



NOTES

1) Execution, Format/Connection:
   I = Plug DIN; E = Eurocard.
   B = Fast plug in standard X = Sealed box on the valve; IP65.
   Versions in sealed box (E-RP) also available.
2) Power supply at 24 VDC ± 10%; E-MI also at 12 VDC ± 10%.
3) Reference signals:
   V = ± 5V; ± 10VDC C = 0 ÷ 5V; 0 ÷ 10VDC A = 4 ÷ 20 mA (optional)
4) RAMPS, ENABLE, FAULT options: see CDT catalog or Atos Internet Site.
5) For double solenoid proportional valves, order two drivers E-MI-AC-01F/7 to be applied on each solenoid of the valve and interconnected by a cable clamp (supplied with driver).

innovative solutions

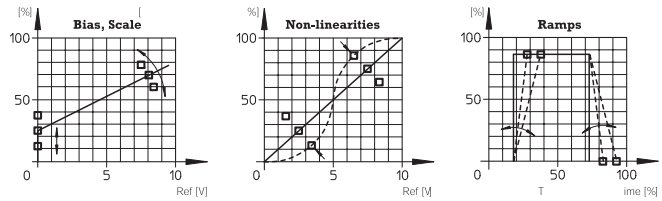
Innovative systems to improve flexibility and performance can be realized today at competitive cost by digital electrohydraulics.
As explanatory application, at side a 6-axis simulator operated by Atos servocylinders with integral digital electronics : a variety of motion cycles can be easily programmed and controlled.

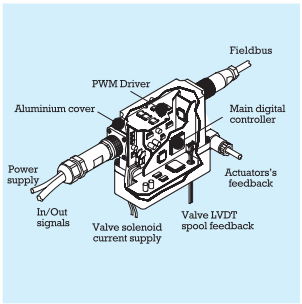
324 - 6-axis electrohydraulic simulator

• AXIS CONTROL BY DIGITAL ELECTROHYDRAULICS

New Atos digital electronics can provide the closed-loop control of position, speed and/or force of any electrohydraulic axis, also acting as electronic driver for the proportional valve, with following features:
- motion cycle and hydraulic parameters i.e. bias, scale and ramp, see figures below, are easily set via software by PC or hand-hold terminal;
- direct interfacing with standard transducers: potentiometers, magnetosonics, rotative or linear encoders;
- better performances: hysteresis, response time, linearity;
- compensation of non-linearities, regulation of the dynamic response;
- diagnostics (fault, monitor) and computer assisted maintenance;
- water-proof configuration (IP65).

325 - Parameters setting via software by PC or hand-hold terminal



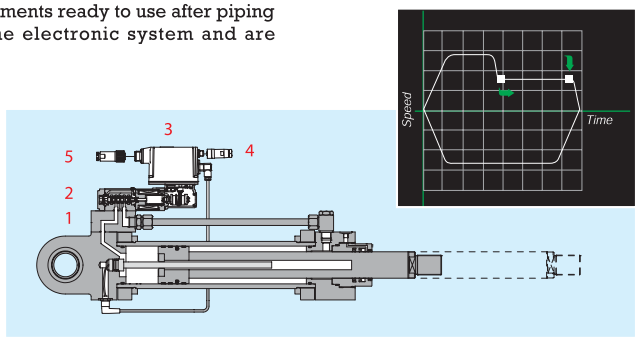


326 - integral digital controller

• DIGITAL SERVOACTUATORS

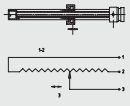
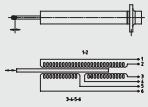
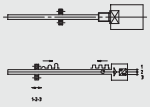
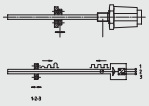
Atos servoactuators are smart machines' elements ready to use after piping to the hydraulic source and wiring to the electronic system and are composed by:
- a servocylinder with integral position transducer
- b proportional valve
- c integral digital controller
- d electronic feedback signal
- e connections to electric power source, electronic signals and fieldbus network.

The motion cycle and the hydraulic functional parameters can be programmed via software at your pleasure.



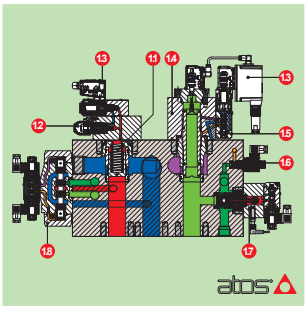
327 - AZP linear servoactuator

328 - Servocylinders may be supplied with potentiometric, inductive or magnetosonic built-in transducers

Code	CKP	CKV	CKF	CKM
Transduce type	potentiometric	inductive	magnetosonic, analog	magnetosonic
Linearity	± 0,05 %	± 0,05 %	± 0,02 %	± 0,02 %
Repeatability	± 0,05 %	± 0,05 %	± 0,001 %	± 0,001 %
Max velocity	0,5 m/s	2 m/s	2 m/s	2 m/s
Strokes	100 ÷ 900	100 ÷ 1000	100 ÷ 1000	100 ÷ 3000
Interface	Voltage 0 ÷ 10V	Voltage: 0 ÷ 10V Current: 4 ÷ 20mA (1)	Voltage 0 ÷ 10V	Serial SSI an-Bus, Profibus 2)
Typical application	Various, compact construction	Simulators, compact construction	Sawing machines, Various	Steel plants, Plastics
Working life	5x10⁶ cycles	30x10⁶ cycles	30x10⁶ cycles	30x10⁶ cycles
Temperature limits	-20°C to +75°C	-30°C to +75°C	-40°C to +75°C	-40°C to +75°C
				

(1) The external electronic box (to be ordered separately) provides several analogic output, for further information, please consult our technical office
(2) Analogic output: 0 ÷ 10V or 4 ÷ 20mA are available on request.

blocks



329 - blocks

Atos standard & customized blocks integrate the electrohydraulic valves into properly machined manifolds with full assembling and connections. The blocks are tested and preset for integration in the machine and ready to use.

The modular "meccano" conception of Atos valves - cartridge, subplate or screw-in - enables reliable systems to be easily assembled, also helping operation and service in the field.

Atos blocks are:

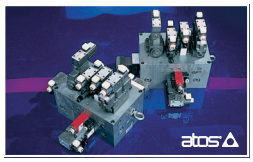
- tailored to the specific requirements.
- conceived for the optimum systems' performances
- designed and machined using CAD/CAM technology
- in cast iron, steel or aluminium alloy.

The blocks integrate proportional speed-position control of tools and auxiliary functions.

Customized blocks control clamping and injection phases by proportional valves with optional CAN-Bus interface.

BG certified blocks perform synchronization by proportional valves and provide **CE marking**.

Steel blocks in rugged execution fit ISO/DIN cartridges in on/off and proportional versions.



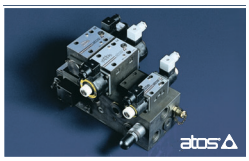
Electrohydraulic benches fitted with manifold blocks ensure high reliability and performances.

Multiple load-sensing blocks with proportional valves and screw-in compensators control the crane booms.

Standard multi-stations subplates, carrying solenoid valves and modulars, provide easy servicing.

Customized blocks are designed for the best operation of on-road machines.

The proportional valve controls the automatic levelling of the platform. Screw-in cartridges fitted to arrange auxiliary functions.



BG certified blocks control the actuation of the blade plus the pressure setting of hold-down cylinders.