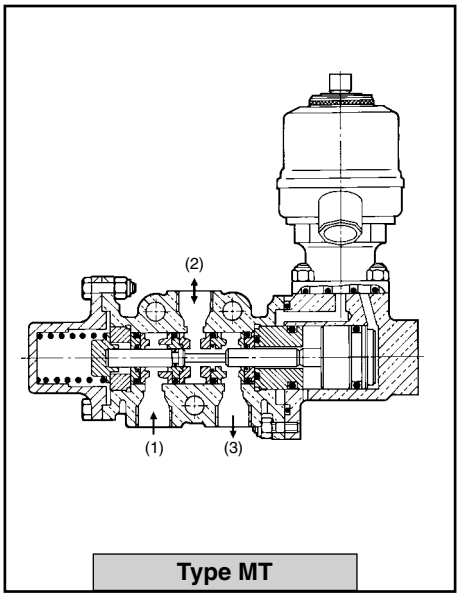
SPOOL VALVES

direct operated / pilot operated
monostable or bistable
3/8 - 1/2

NC

3/2
Series
231
(type T)



Type MT

FEATURES

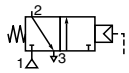
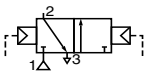
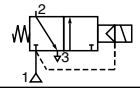
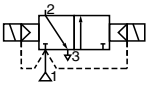
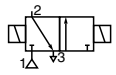
- *Accepts a wide range of operators*
- *Used in fluid remote control and servo systems*
- *The solenoid valves satisfy all relevant EC directives*

GENERAL

fluid (✳)	temperature range (TS)	seal materials (✳)
water, air, inert gas, oil	-10°C to +80°C	NBR (nitrile)

Differential pressure 0 to 12 bar [1 bar = 100 kPa]
0 to 10 bar (with "ET" pilots) see overleaf

Maximum allowable pressures and functions:

symbol	operators	(C)	pipe size	maximum allowable pressure		
				air (✳)	water (✳)	oil (✳)
			(G*)	(bar)	(bar)	(bar)
air operated - spring return (monostable function)						
	piston	1	3/8	35	30	25
		1	1/2	30	25	20
	diaphragm	2	3/8	35	30	25
		2	1/2	30	25	20
air operated - air return (bistable function)						
	piston	3	3/8	35	30	25
		3	1/2	30	25	20
	diaphragm	4	3/8	35	30	25
		4	1/2	30	25	20
solenoid-air operated - spring return (monostable function)						
	pilot type MB (1) (series 121)	5	3/8	35 (1)	30 (1)	25
		5	1/2	30 (1)	25	20
solenoid-air operated and return (bistable function)						
	pilot type MB (1) (series 121)	6	3/8	35 (1)	30 (1)	25
		6	1/2	30 (1)	25	20
direct electric operated and return (bistable function)						
	"ET" type electro-magnets	~	7	3/8	30	20	10
		=	8			

Maximum viscosity 40 cSt (mm²/s)
Ambient temperature range (TS) -10°C to +40°C
Pilot fluid Water, air, inert gas, oil (40 cSt max.)
Pilot pressure See "Specification" overleaf
Pilot fluid temperature (TS) +60°C max.

MATERIALS IN CONTACT WITH FLUID

(✳) Ensure that the compatibility of the fluids in contact with the materials is verified

Body Brass (G3/8) - Bronze (G1/2)
Internal parts Stainless steel
Spring Steel
Seals NBR
Pressure operators:
piston Stainless steel, NBR seals
diaphragm NBR
Shading coil Copper

OTHERS MATERIALS

3/2 solenoid-air operator:
series 121 (type MB) see V575
solenoid head in metal housing to IP65
Direct electric operator:
solenoid "ET" heads **MPV1** (AC ~) and **CPV1** (DC =), see V902-12
MPV1 (AC ~) Metal housing to IP54
CPV1 (DC =) Cast housing to IP65

(C) Construction type, see "Dimensions"
(1) Maximum allowable pressure > 25 bar, use option: external pilot supply (see "Options")

ELECTRICAL CHARACTERISTICS

Coil isolation class E (class B for CPV1)
Coil connection Terminals integral with coil
Cable entry Cable gland Pg 11M [MB] or Pg 11P [ET]
Electrical safety IEC 335
Standard voltages DC (=) : 24V
(Other voltages and 60 Hz on request) AC (~) : 24V - 115V - 230V / 50 Hz

pilot type	solenoid head	nominal power rating				ambient temperature range (TS)	coil class	coil construction
		inrush ~	holding ~		=			
		(VA)	(VA)	(W)	(W)	(°C)		
MB (series 121)	terminals -12W	75	22	12	8	-10 to +40	E	wrapped
ET	MPV1(~)	600	55	15	-	-10 to +40	E	wrapped
	CPV1(=) (1)	-	-	-	80		B	moulded

SPECIFICATIONS

pipe size	orifice size	flow coefficient Kv		maximum differential pressure (bar)			pilot pressure		operator type	(C)	(M)	catalogue number		reference
				min.	maximum (PS) air water/oil (✳)		min.	max.				NBR sealings		
(G*)	(mm)	(m^3/h)	(l/min)		~	=	(bar)	(bar)						
NC - normally closed - air operated spring return														
3/8	9	1,14	19	0	12	12	3	30	piston	1	×	**23100037**		T302 RH
1/2	15	3,18	53	0	12	12	3	30	piston	1	×	**23100085**		T303 RH
3/8	9	1,14	19	0	12	12	1	15	diaphragm	2	×	**23100038**		T302 RN
1/2	15	3,18	53	0	12	12	1,5	15	diaphragm	2	×	**23100053**		T303 RN
NC - normally closed - air operated and return														
3/8	9	1,14	19	0	12	12	3	30	pistons	3	×	**23100097**		T302 H2
1/2	15	3,18	53	0	12	12	3	30	pistons	3	×	**23100099**		T303 H2
3/8	9	1,14	19	0	12	12	0,7	15	diaphragms	4	×	**23100096**		T302 N2
1/2	15	3,18	53	0	12	12	1	15	diaphragms	4	×	**23100098**		T303 N2
NC - normally closed - solenoid-air operated - spring return (2)												(~)	(=)	
3/8	9	1,14	19	3 (3)	12	12	3 (3)	12	MB pilot	5	×	**23100039**	**23100042**	MT 302
1/2	15	3,18	53	3 (3)	12	12	3 (3)	12	MB pilot	5	×	**23100055**	**23100058**	MT 303
NC - normally closed - solenoid-air operated and return (2)														
3/8	9	1,14	19	3 (3)	12	12	3 (3)	12	MB pilots	6	×	**23100075**	**23100100**	M2T 302
1/2	15	3,18	53	3 (3)	12	12	3 (3)	12	MB pilots	6	×	**23100051**	**23100052**	M2T 303
NC - normally closed - direct electric operated and return														
3/8	9	1,14	19	0	10	10	-	-	ET-MPV1 (~)	7	×	**23100036**	**-**	ET 302 (~)
									ET-CPV1 (=)	8	×	**-**	**23100353**	ET 302 (=)

(M) Manual operator: × : without (manual operator on request, see "Options" below)
(C) Construction type, see "Dimensions"
(1) With DC, control must be by pulse. If voltage is maintained, each solenoid must be provided with a fuse (consult us)
(2) With internal pilot fluid supply (external supply optional)
(3) Working pressure < 3 bar, use external pilot supply option

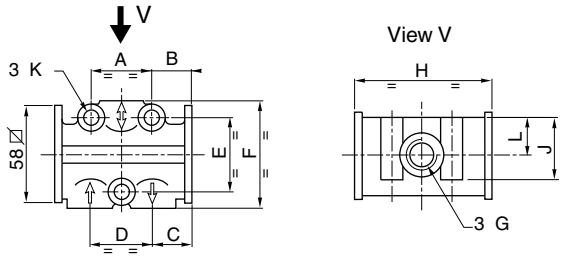
OPTIONS

- Valve body:
  - Impulse or holding manual return
  - FPM seal (fluoroelastomer) - maximum allowable pressure 20 bar max.
  - Oxygen rated, code **970521**
  - Chrome plating, code **165506**
  - Control valve for pressure differential > 12 bar max. (limited by maximum allowable pressure) (Kv reduced by 30%)
  - Closed centre neutral position control valve (W1) - only in versions with air operated and return (piston type) or solenoid-air operated and return (MB pilots) - maximum differential pressure 12 bar)
  - Universal function (distributor or mixer function - maximum pressure differential 12 bar)
- With air operated:
  - Impulse or maintained manual operator
- With solenoid-air operated:
  - External pilot fluid supply
  - Button or impulse manual operator
  - Flameproof enclosure to Ex **d**, for potentially explosive atmospheres according to "**ATEX/IECEx**":
    . pilot MB (series 121) see X019-105
    . solenoid ET (series 131) see X019-110
  - Pilots certified to Ex **mb**, for potentially explosive atmospheres according to "**ATEX/IECEx**" (contact us)
  - Options concerning pilot MB, see 05-75
  - Options concerning solenoid ET, see 09-05-15

INSTALLATION

- Possible spool valve control configurations:
  - air operators: **all positions**
  - solenoid-air operator, pilot MB (series 121): all positions, **except solenoid head downwards**
  - direct operated, solenoid ET: **magnetic head must remain horizontal**
  - all operator and return systems can be oriented at 90° increments in relation to pipes
- For electrically-operated control valve "ET" on DC: observe power supply precautions, note (2) on preceding page
- Pipe connections (G*) have standard combination thread according to ISO 228/1 and ISO 7/1
- Spare parts kits and replacement coils are available

DIMENSIONS (mm), WEIGHT (kg)



G 3/8 and G 1/2 body

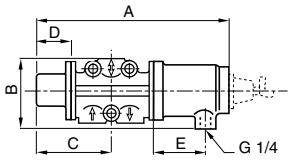
(G*)	A	B	C	D	E	F	H	J	Ø K	L
3/8	36	25	24,5	37	44	64	86	66	8,5	26
1/2	50	30	30	50	60	84	110	82	10,5	31

Ø K: 3 fixing holes

NOTE: all operators and return systems are rotatable at 90° increments in relation to pipes

Construction 1

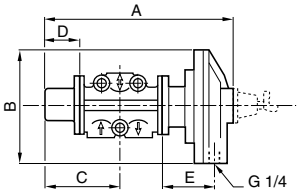
Piston type air operator - spring return



(G*)	A	B	C	D	E	**weight** (kg)
3/8	183	64	77	34	39	2,6
1/2	231	72	101	46	50	3,9

Construction 2

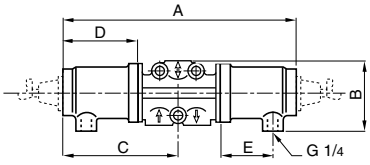
Diaphragm type air operator - spring return



(G*)	A	B	C	D	E	**weight** (kg)
3/8	189	114	77	34	52	3,2
1/2	225	114	101	46	52	4,5

Construction 3

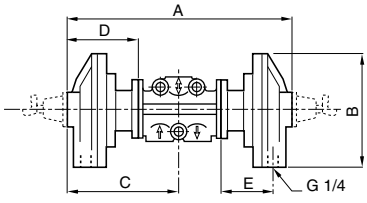
Piston type air operator and return



(G*)	A	B	C	D	E	**weight** (kg)
3/8	212	64	106	63	39	3,5
1/2	260	72	130	75	50	4,8

Construction 4

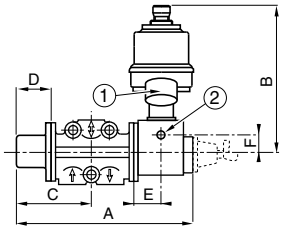
Diaphragm type air operator and return



(G*)	A	B	C	D	E	**weight** (kg)
3/8	224	114	112	69	52	4,7
1/2	248	114	124	69	52	6

Construction 5

Solenoid-air operator (pilot MB series 121) - spring return



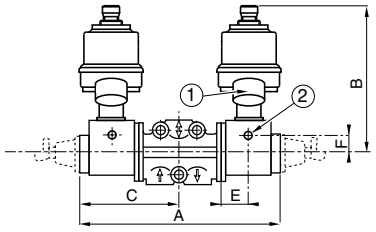
(G*)	A	B	C	D	E	F	**weight** (kg)
3/8	182	137	77	34	26,5	20	2,7
1/2	248	143	101	46	53,5	26	4

(1) Cable gland (Pg 11P)

(2) Optional external supply (G 1/4)

Construction 6

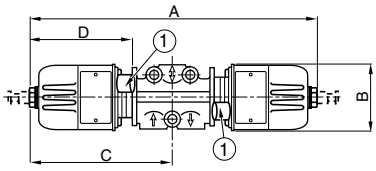
Solenoid-air operator and return - pilot MB (series 121) **WEIGHT** (kg)



(G*)	A	B	C	E	F	**weight** (kg)
3/8	210	137	105	26,5	20	4,3
1/2	294	143	147	53,5	26	5,6

Construction 7

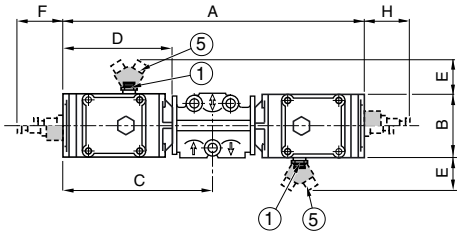
AC direct electric operator and return (solenoid heads MPV1)



(G*)	A	B	C	D	E	**weight** (kg)
3/8	360	95	180	137	34	5,2

Construction 8

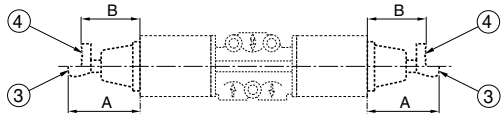
DC direct electric operator and return (magnetic heads CPV1)



(G*)	A	B	C	D	E	F	H	**weight** (kg)
3/8	428	97	214	171	66	46	67	13,6
1/2	452	97	226	171	66	46	67	15,5

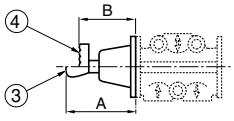
OPTIONS

Additional manual operator



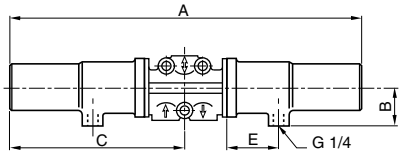
(G*)	A	B	**weight** (kg)
3/8	74	68	0,21
1/2	74	68	0,21

Manual return device on control valve



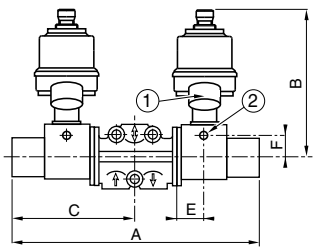
(G*)	A	B	**weight** (kg)
3/8	79	73	0,35
1/2	82	76	1

Control valve with neutral position (centre closed W1), operated by pistons



(G*)	A	B	C	E	**weight** (kg)
3/8	282	30	141	30	4,8
1/2	360	36	180	36	8

Control valve with neutral position (centre closed W1), operated by MB pilots



(G*)	A	B	C	E	F	**weight** (kg)
3/8	282	137	141	26,5	20	5,4
1/2	386	143	193	53,5	26	8,6

(1) Cable gland (Pg 11P)
(2) External supply (G 1/4) option
(3) Impulse manual operator
(4) Screwdriver manual operator
(5) Optional auxiliary contact with 2 cable glands (Pg 11P)