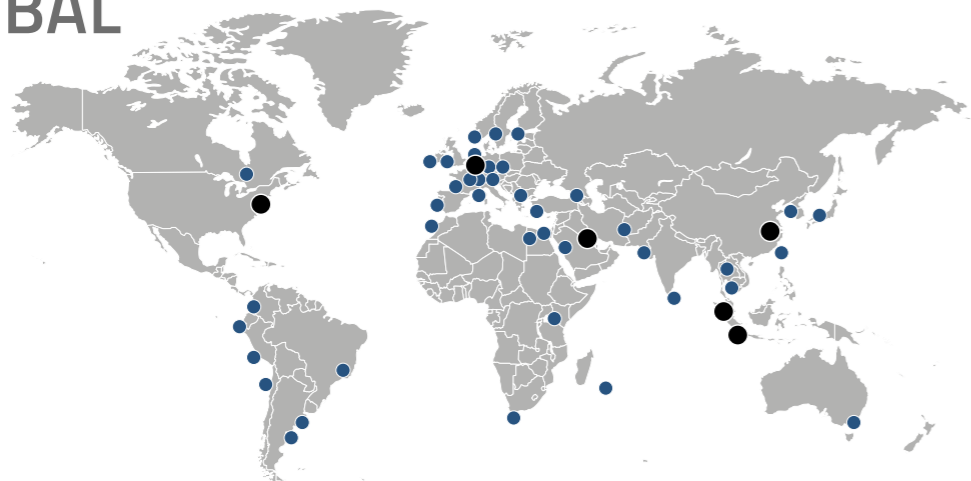




PERFORMANCE FOR MORE THAN 50 YEARS

Rima S.r.l. a socio unico
Via E. Fermi 255
21042 Caronno Pertusella (VA) – Italy
Phone: +39 02 9650694
Fax: +39 02 9657860
General info: rima@rimagroup.com

GLOBAL



WORKING ON IDEAS HANDLING

More than 50 years of experience! Thanks to over 50 years of experience in this field, we have been manufacturing hydraulic rotary actuators for a wide range of application. This allows us to design actuators made in series or customized models in order to suit many application requirements.

www.rimagroup.com

STORM BRAKES

HYDRAULIC SYSTEM

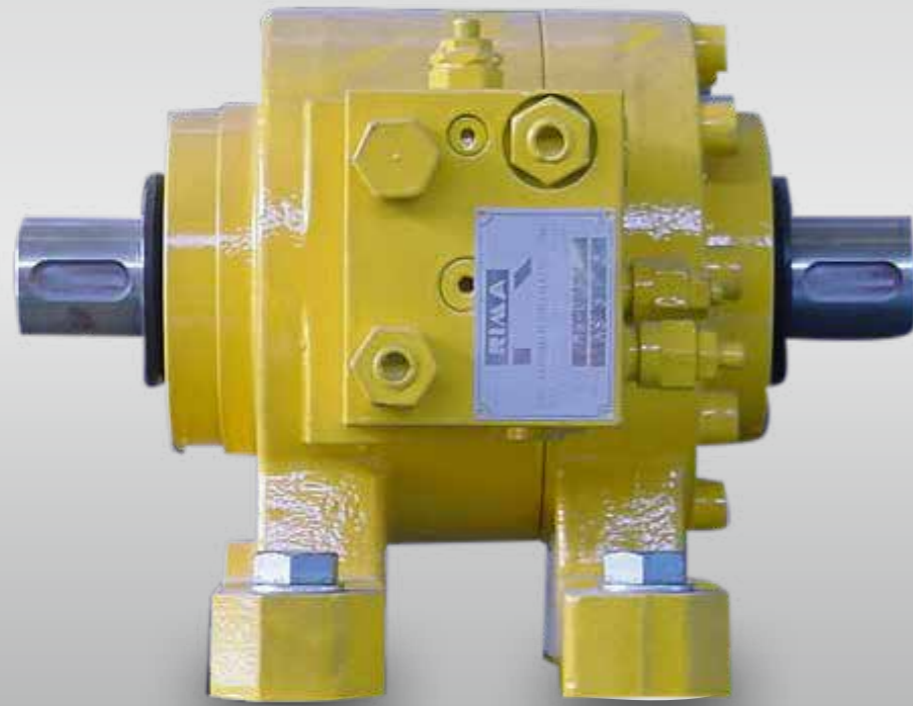
CABLE PROTECTION

ROTARY ACTUATORS

RIMA S.R.L.

PERFORMANCE FOR MORE THAN 50 YEARS

THE SYSTEM



APPLICATIONS

With more than 35 years of experience, we have realized rotary actuators for every kind of application.

The most frequent applications are:

- Back hoes
- Industrial automation machines
- Crane spreaders (flipper movements)
- Presses
- Hydraulic lift
- Injection moulding machines

Our technical department can find the ideal solution for your need, with standard solutions or special executions.

CONSTRUCTION SYSTEM

The actuator can be single or double vane.

The single vane allows a greater rotation angle (260°), the double vane determines the reduction of the rotation angle (90°), but increases considerably the torque supplied, external overall dimensions being equal.

The construction elements are: (see figure)

- | | |
|-----------------------------------|--|
| 1. Casting rotary actuator's body | 7. Shaft (grooved or hollow with tongue) |
| 2. Head | 8. Moving vane |
| 3. Bushing | 9. Moving vane seals |
| 4. Dust seal | 10. Fixed vane |
| 5. Shaft seal | 11. Fixed vane seals |
| 6. Seal | |

Standard actuators must not reach the end of stroke. Therefore external stop devices and / or limit switches must be foreseen. In case of need to reach the end of stroke, particular indication has to be given at request of quotation. For tech. expl. Please contact our Technical Dept. The standard version of rotary actuator can bear limited radial and axial loads. In case of high radial and/or axial loads, please refer to our Technical Dept.

The hydraulic rotary actuator is a device which transform hydraulic power (pressure and flow) in mechanical power: torque and angular speed.

They are used for alternative movements with a limited rotation angle: max 260°.

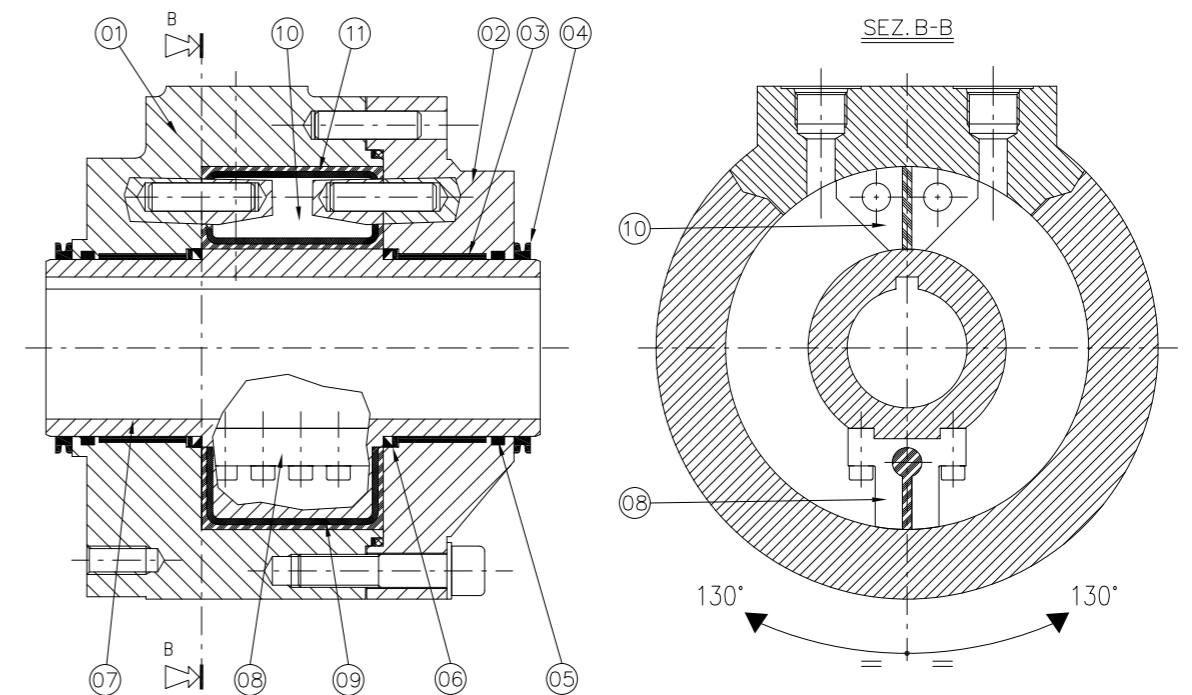
The simplicity of construction of our actuators allows to obtain very high mechanical efficiency value in comparison to the

traditional "hydraulic cylinder-rack" system. The hydraulic rotary actuators Rima have the advantages of a small overall dimensions, a stability of the supplied torque during the run and also a cheap price.

The absence of transmission devices between rotary actuator and utilizer and the mechanical efficiency allow moreover to obtain a very exact torque value.

Our rotary actuators are the ideal choice for all the most advanced applications of automation where high reliability and quality of executions are needed.

The rotary actuators can be positively applied instead of quick motors plus reducers; the elimination of an element (the reducer) cut down the costs, take off the maintenance of an element and usually allows to reduce dimensions.



INSTALLATION RULES AND FUNCTIONING OF HYDRAULIC CIRCUIT

In the hydraulic circuit it is convenient to foresee "anti-shock" valves which avoid pressure peaks in the rotary actuator. The suggested circuit is the one shown in figure A.

Assembly

The actuator can be fixed with feet or flange. In case of flange, the two holes not threaded must be bored during assembly, in order to receive the

centering pins with force fit. The torque of the rotary actuator must not be transmitted to the fixing screws. The shaft is smooth on a side and grooved on the other side. The execution with hollow shaft foresees a tongue. We suggest the execution with oil connections on the upper part, to facilitate air draining.

Median position (see figure B)

In the execution with output shaft:

single vane: position the arrow on the shaft down side

double vane: position the arrow on the shaft on right side

In the execution with hollow shaft:

position the grooves on up side. Filtering. For a correct functioning, an oil filtering of at least 25 micron is required

Filtering

For a correct functioning, an oil filtering of at least 25 micron is required.

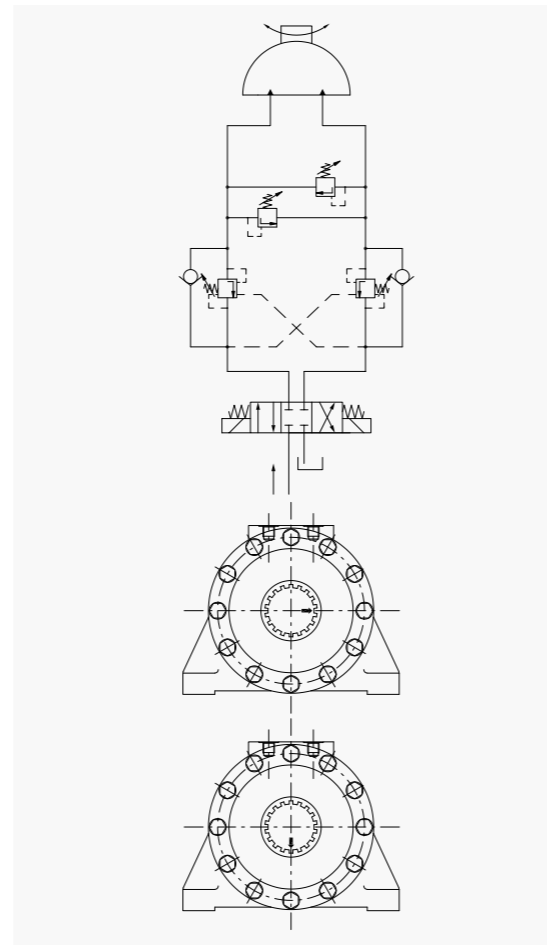
Hydraulic oil

In the standard execution it is foreseen the use of normal oil with viscosity between

1,8 and 50°E (between 10 and 370 cSt). Upon request can be used seal suitable for phosphoric ester or for water.

Working temperature

From -20°C to +80°C (with Teflon seals). Different temperatures upon request.



SPECIAL EXECUTIONS

RIMA can make a wide range of customization and fittings to make the actuators suitable to several applications. Here after the most common special executions:

Minimum quantities are required for special executions.

Actuators suitable to bear radial and /or axial loads

Actuator with holes, shafts different from standard

Actuator with a rotation angle different from standard

Actuator for high speed

OUR EXPERIENCE

There are many types of actuators: pneumatic, hydraulic, vane, piston and ground rack. RIMA is specialized in manufacturing hydraulic vane rotary actuators. Peculiarity of this kind of

actuator is high efficiency and minimum effect Slipstick. Our know-how makes our actuator the best solution for applications in which high torque and defined angle are required.

RIMA actuators have a max. torque from 1.200Nm to 83.000 Nm, at 3.000 Psi (210 Bar) according to size.

R6	030	AS	S	P	N
Rotary actuators	Displacement	AS = protruding shaft	S = single vane	P = feet	N = standard execution
		AC = hollow shaft	D = double vane	F = flange	S = special execution

TECHNICAL CHARACTERISTICS

Working pressure: 210 bar

Torques: from 100 to 80000 Nm

Angle: single vane 260°, double vane 90°

Leakages: see figure C

Efficiency: with Teflon seals: single vane 90%, double vane 95%

The torque values take into account the efficiency.

Calculation for pump delivery: $Qt = \frac{v \cdot 60}{\alpha \cdot \max t}$

Qt = theoretic pump delivery (l/min.)

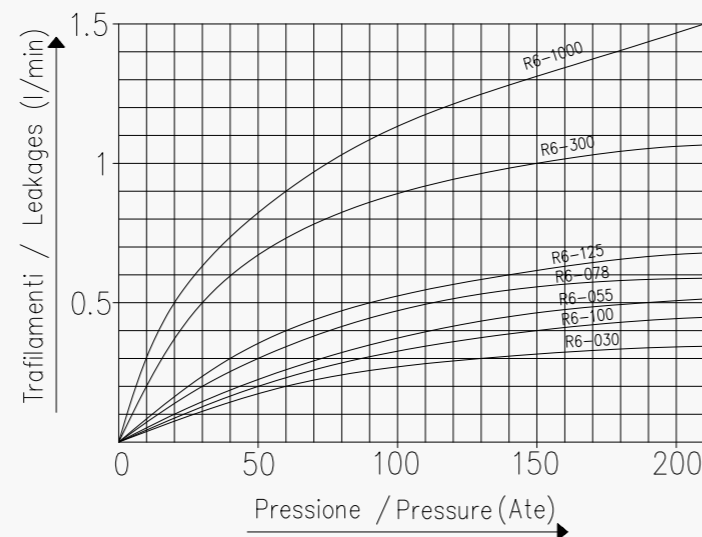
V = displacement (l)

α = required angle

$\alpha \max$ = actuator max angle

t = required time (seconds) to carry out the angle α

effectiveQ = Qt + leakages (see diagram figure C)



TYPES AND MAIN DATA

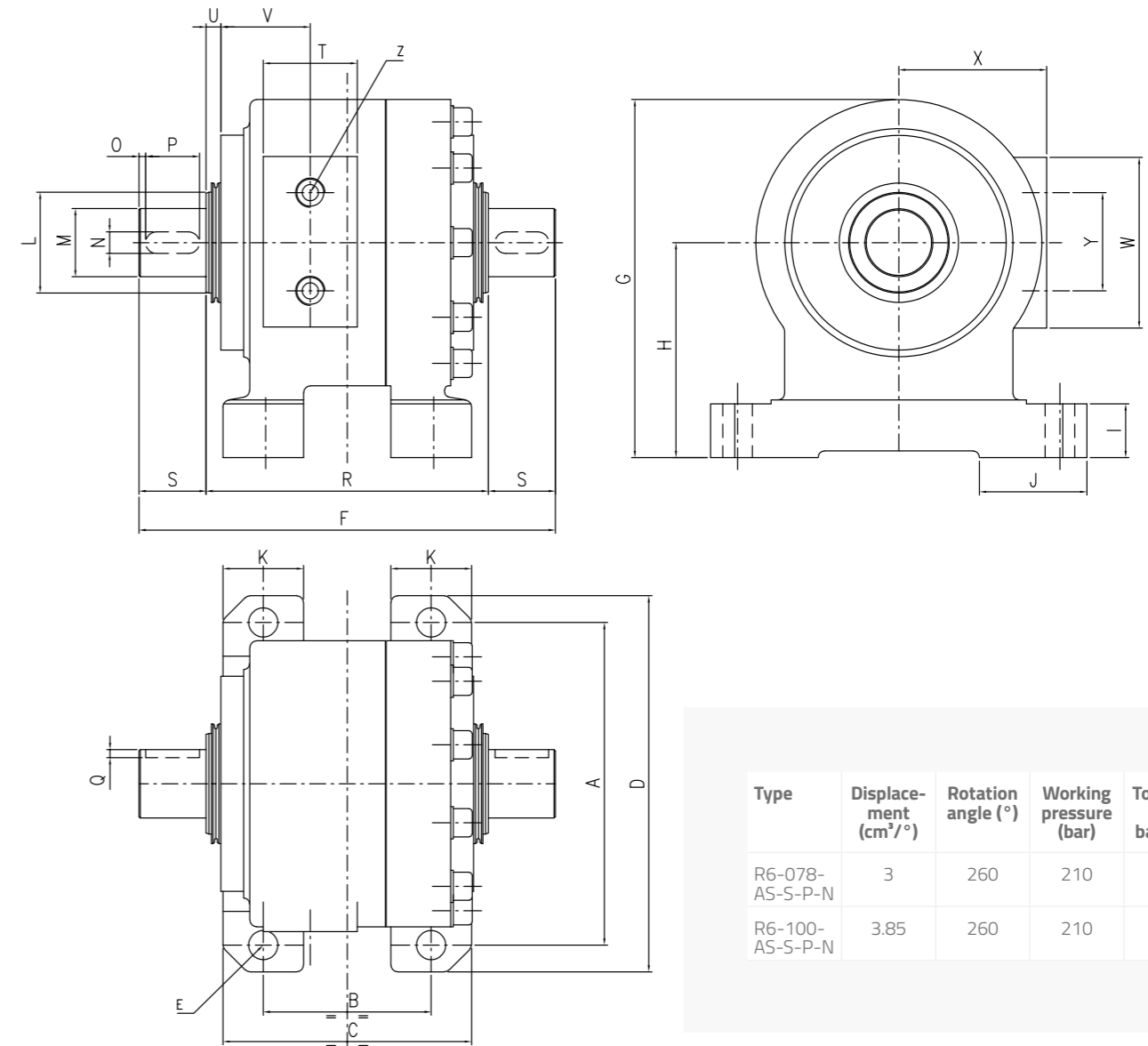
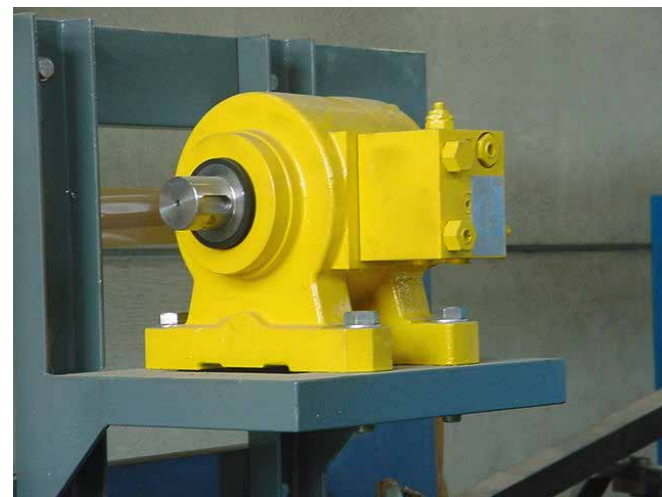
Type	Shaft	Rotation angle	Torque at 210 bar (Nm)	Displacement (cm³/°)	Weight without oil (kg)
R6-030-ASS	Protruding	260	1200	1.15	20
R6-022-ASD	"	90	2500	2.44	21
R6-078-ASS	"	260	3000	3	65
R6-100-ASS	"	260	3800	3.85	50
R6-070-ASD	"	90	8000	7.78	51
R6-300-ASS	"	260	11600	11.54	160
R6-214-ASD	"	90	24500	23.78	162
R6-1000-ASS	"	260	39000	38.46	440
R6-730-ASD	"	90	83000	81.11	450
R6-055-ACS	Hollow	260	2000	2.12	30
R6-078-ACS	"	260	3000	3	35
R6-125-ACS	"	260	4800	4.81	43

SPREADER APPLICATIONS

One of the rotary actuators' applications is the flipper movement for spreaders. Our models, conceived expressly for this use, are fixed with feet. This simplify the

installation and assembly on spreaders, reducing the production cost. The presence of special valves, assembled directly on the rotary actuator, keep safe

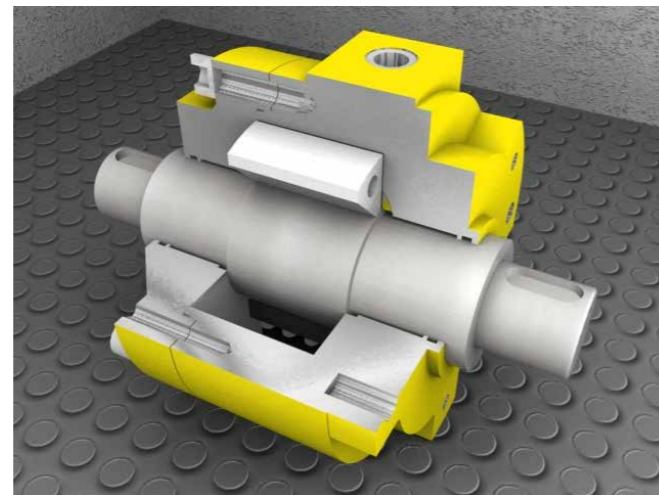
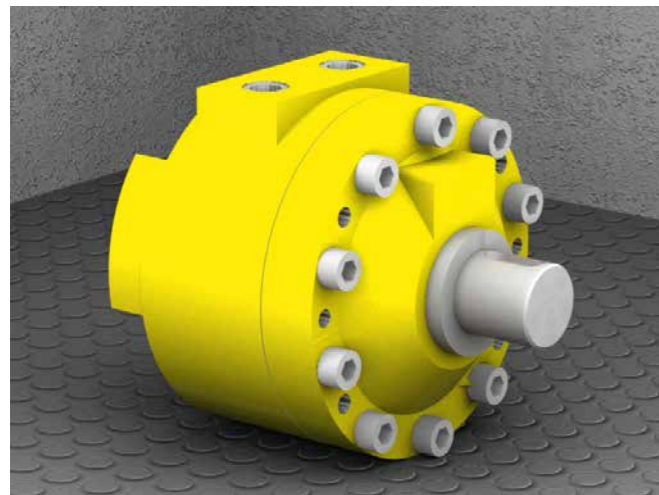
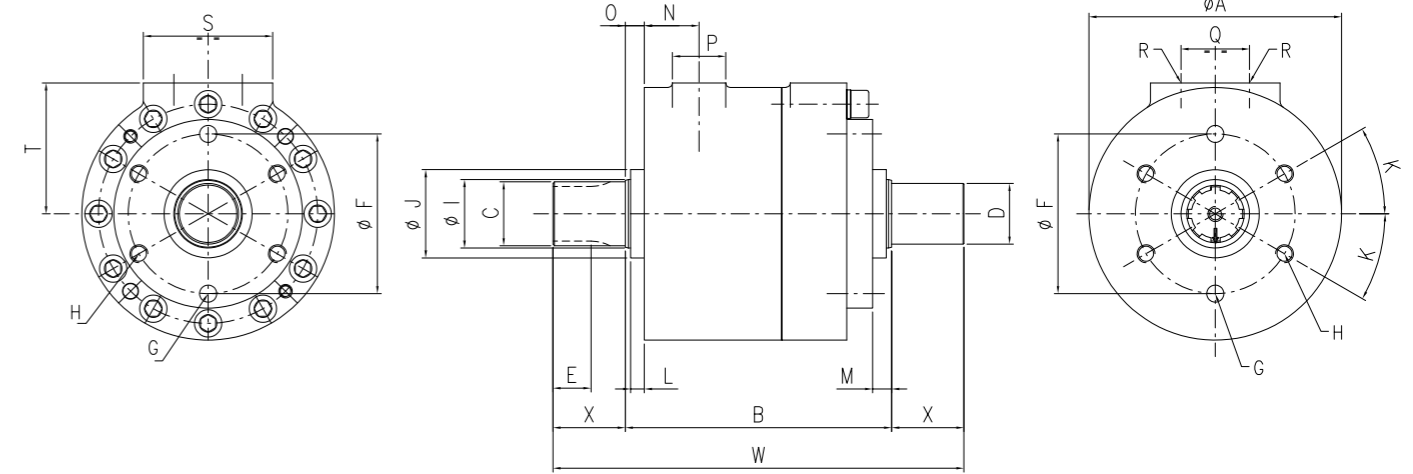
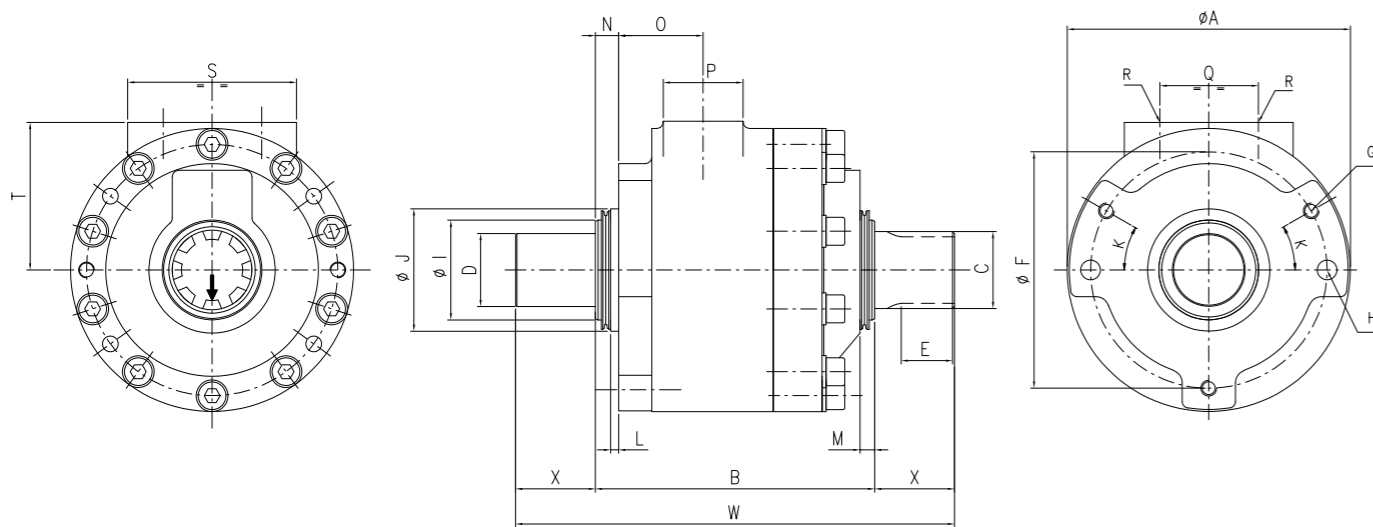
the spreader against pipe damages and provides an effective anti-shock protection.



Type	Displacement (cm ³ /°)	Rotation angle (°)	Working pressure (bar)	Torque at 210 bar (Nm)
R6-078-AS-S-P-N	3	260	210	3000
R6-100-AS-S-P-N	3.85	260	210	3800

Type	A	B	C	D	E	F	G	H	I	K	J	L	M
R6-078	250	130	195	300	N°4 ø23	355	267	160	0 -0.1	40	65	90	ø75 h7 ø50.8 h8
R6-100	260	158	197	305	N°4 ø17	332	238	118	+0.15 -0.15	30	65	45	ø65 h7 ø60 k6

Type	N	O	P	Q	R	S	T	U	V	W	X	Y	Z		
R6-078	16	-0.018 -0.061	5	40	6	+0.2 0	255	50	70	12.5	88.5	127	110	73	G1/2"
R6-100	18 N9	3	46	7	+0.2 0	226	53	45	1	56	120	-	63	G3/8"	



Type	Displacement (cm ³ /°)	Rotation angle (°)	Working pressure (bar)	Torque at 210 bar (Nm)	Type	Displacement (cm ³ /°)	Rotation angle (°)	Working pressure (bar)	Torque at 210 bar (Nm)
R6-022-AS-D-F-N	2.44	90	210	2500	R6-030-AS-S-F-N	1.15	260	210	1200
R6-070-AS-D-F-N	7.78	90	210	8000	R6-100-AS-S-F-N	3.85	260	210	3800
R6-214-AS-D-F-N	23.78	90	210	24500	R6-300-AS-S-F-N	11.54	260	210	11600
R6-730-AS-D-F-N	81.11	90	210	83000	R6-1000-AS-S-F-N	38.4	260	210	39000

Type	A	B	C	D	E	F	G	H	I	K	J	L	M
R6-022	166	184	36 UNI 221	Ø40 h8	25	105	N°4 Ø12H7x20	N°8 M12x20	Ø45 h7	30°	Ø58 h8	9	17
R6-030	166	175	36 UNI 221	Ø40 h8	25	105	N°4 Ø12H7x20	N°8 M12x20	Ø45 h7	30°	Ø58 h8	9	12.5
R6-070	235	242	52 UNI 221	Ø55 h7	40	143	N°4 Ø15H7x32	N°8 M14x30	Ø65 h7	30°	Ø85 h8	10	19
R6-100	235	242	52 UNI 221	Ø55 h7	40	143	N°4 Ø15H7x32	N°8 M14x30	Ø65 h7	30°	Ø85 h8	10	19
R6-214	350	304	82 UNI 221	Ø85 h7	75	225	N°4 Ø22H7x47	N°8 M20x35	Ø95 h7	30°	Ø125 h8	17	26
R6-300	350	304	82 UNI 221	Ø85 h7	75	225	N°4 Ø22H7x47	N°8 M20x35	Ø95 h7	30°	Ø125 h8	17	26
R6-730	520	450	150 UNI 221	Ø135 h8	145	350	N°4 Ø31,5H7x50	N°8 M27x50	Ø155 h7	30°	Ø280 h8	25	45
R6-1000	520	450	150 UNI 221	Ø135 h8	145	350	N°4 Ø31,5H7x50	N°8 M27x50	Ø155 h7	30°	Ø280 h8	25	45

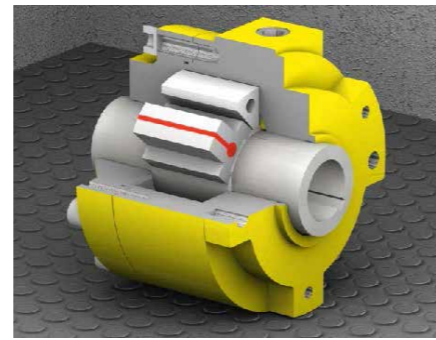
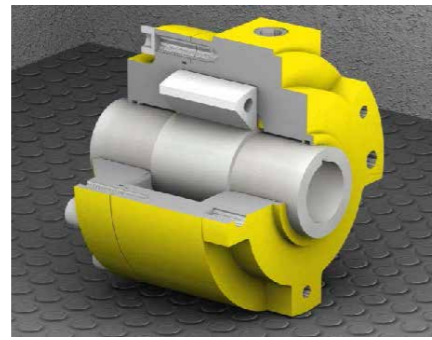
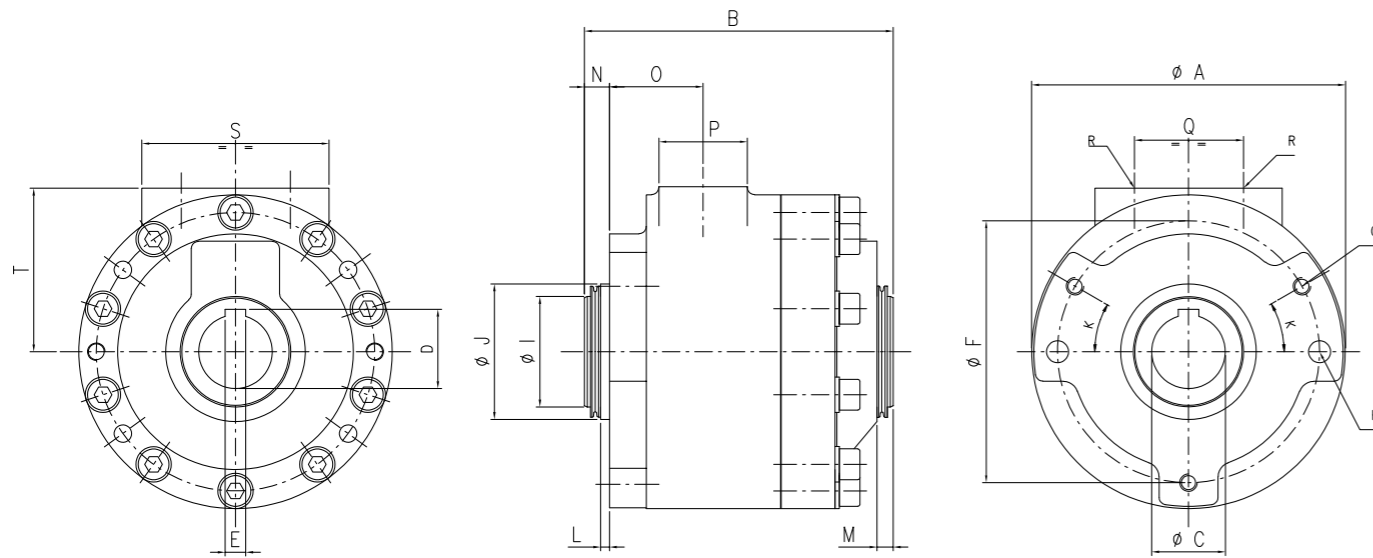
Type	Displacement (cm ³ /°)				Rotation angle (°)				Working pressure (bar)				Torque at 210 bar (Nm)			
R6-078-AS-S-F-N	3				260				210				3000			

Type	A	B	C	D	E	F	G	H	I	K	J	L	M
R6-078	212	210	52 UNI 221	Ø55 h7	40	180	N°3 M12x25	N°2 Ø15x32	75 h7	30°	92 h7	6	11

Type	N	O	P	Q	R	S	T	U	V	W	X
R6-078	17.5	63.5	60	73	G1/2"	127	112	-	-	330	60

Type	N	O	P	Q	R	S	T	U	V	W	X
R6-022	17	36	35	45	G1/4"	85	86	-	-	270	43
R6-030	12.5	36	35	45	G1/4"	85	86	-	-	270	47.5
R6-070	19	46	45	63	G3/8"	120	120	-	-	362	60
R6-100	19	46	45	63	G3/8"	120	120	-	-	362	60
R6-214	26	51	45	95	G3/4"	185	180	-	-	510	103
R6-300	26	51	45	95	G3/4"	185	180	-	-	510	103
R6-730	45	150	100	140	G1"	230	270	-	-	780	103
R6-1000	45	150	100	140	G1"	230	270	-	-	780	165

NOTES



Type	Displacement (cm ³ /°)	Rotation angle (°)	Working pressure (bar)	Torque at 210 bar (Nm)
R6-055-AC-S-F-N	2.12	260	210	2000
R6-078-AC-S-F-N	3	260	210	3000
R6-125-AC-S-F-N	4.81	260	210	4800

Type	A	B	C	D	E	F	G	H	I	K	J	L
R6-055	213	185	50 H7	53.8 0 +0.2	14 H8	180	N°3 M12x25	N°2 Ø15H7/32	75 h7	30°	92 h7	6
R6-078	213	210	50 H7	53.8 0 +0.2	14 H8	180	N°3 M12x25	N°2 Ø15H7/32	75 h7	30°	92 h7	6
R6-125	213	255	50 H7	53.8 0 +0.2	14 H8	180	N°3 M12x25	N°2 Ø15H7/32	75 h7	30°	92 h7	6.35

Type	M	N	O	P	Q	R	S	T	U	V
R6-055	11	17.5	63.5	50	73	G1/2"	127	111	-	-
R6-078	11	17.5	63.5	60	73	G1/2"	127	112	-	-
R6-125	5.8	18.5	63.5	60	73	G1/2"	127	112	-	-