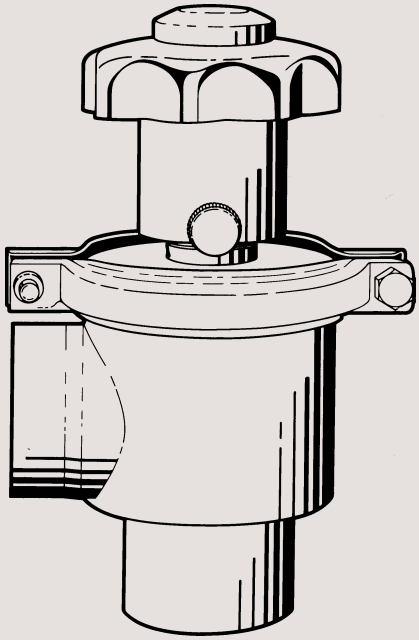
Instruction Manual

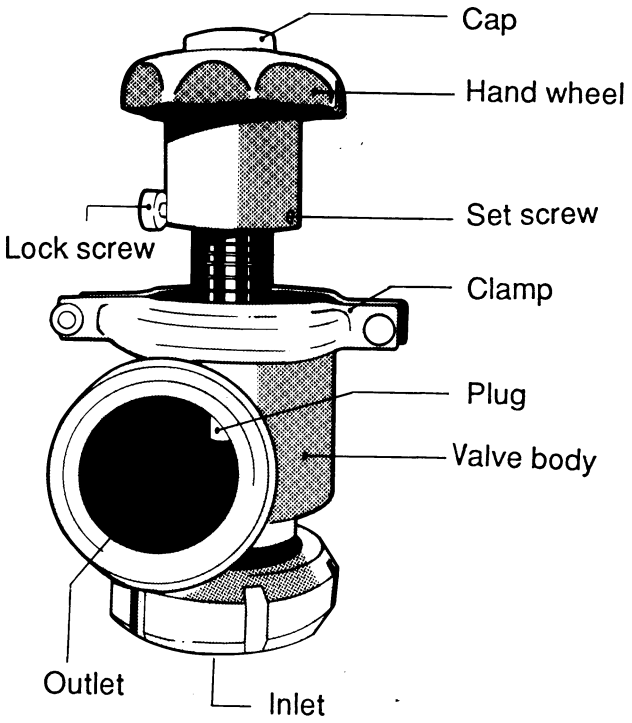
SMO-R Manual Regulating Valve

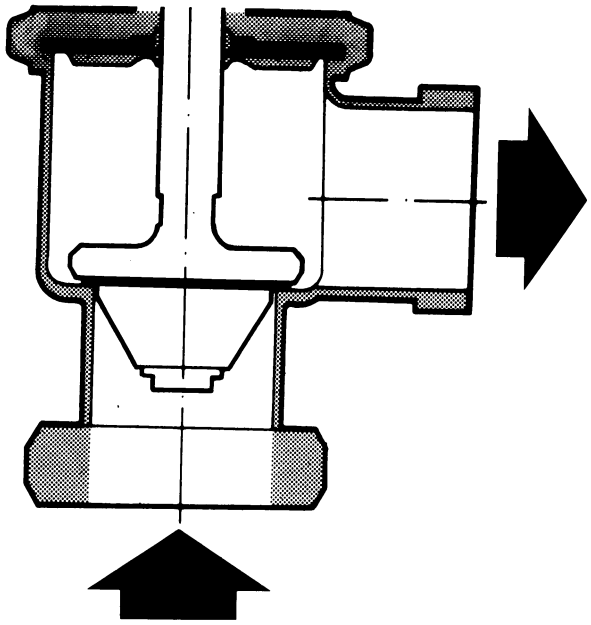


IM70179-GB2 1992-02

Contents:

Type SMO-R manual regulating valve





Valve body part

The regulating valve is identical to type SMO stop valve, apart from the bottom regulating plug in the valve plug, which has been given a different design in order to obtain better regulating characteristics.

The crank has been exchanged by a hand wheel.

The regulating plug can be fitted in the SMO valves.

The regulating valve has two body ends. They can be provided with required connections for pipes used in the food industry. The best regulating characteristics are obtained if the lower body end is used as the inlet. The valve is normally delivered with liner/nut on the lower body end and male part on the side body end.

Clamp, lip seal and valve plug are included in the valve body part.

Operating mechanism

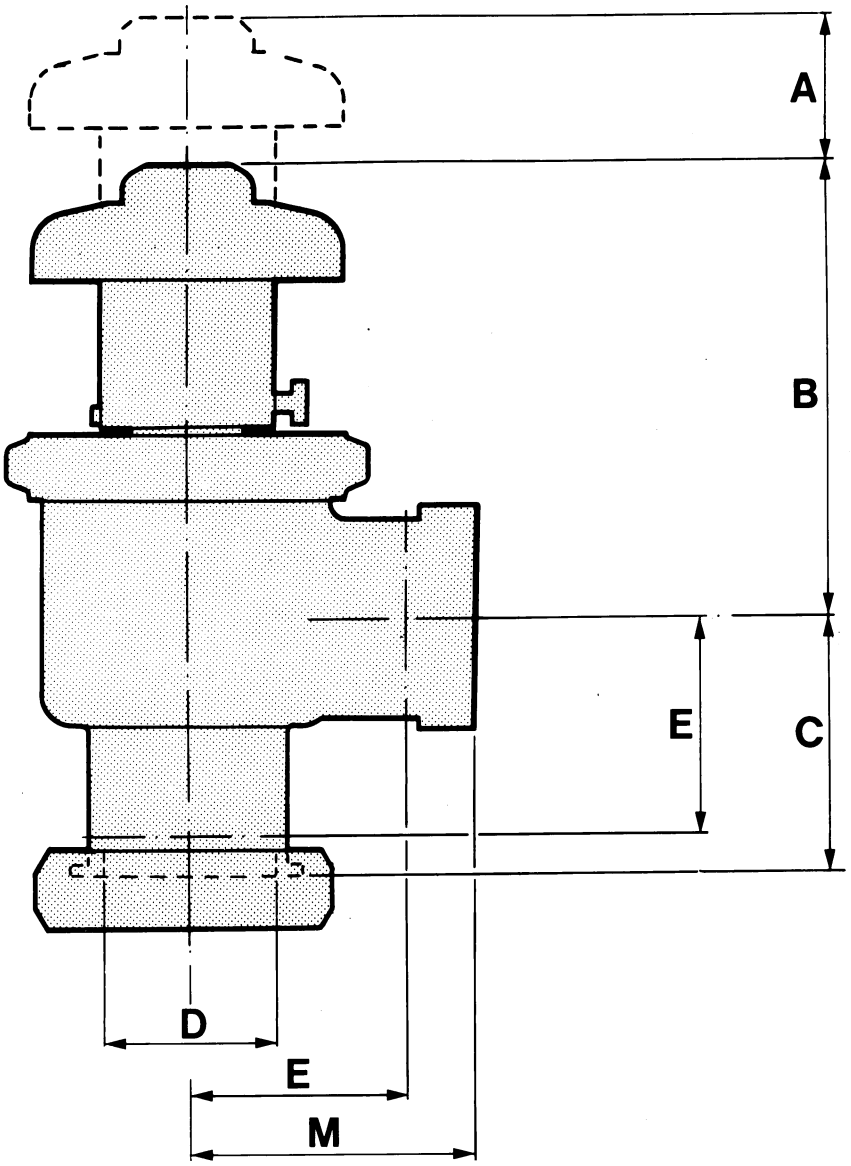
The valve is operated by means of an operating mechanism. About seven turns of the hand wheel result in a full stroke of the valve plug.

The operating mechanism is easy to dismantle. The guide is provided with rings at a distance of 4 mm. One turn of the hand wheel corresponds to a stroke of 4 mm.

All parts with the exception of the guide are common for all valve sizes and versions.

There are two guide sizes, one for 38-63.5 mm (1½ - 2½ in) and one for 76-101.6 mm (3-4 in).

Dimensions



D (dim. in mm)	38	51	63.5	76	101.6
A	31	31	31	31	31
B	120	120	135	145	170
C/IDF (I.S.S)	62	74	94	101	101
C/DIN	68	82	102	107	157
E/W	50	62	82	87	134
M/SMS	70	82	106	111	169
M/IDF (I.S.S)	72	84	104	109	-
M/DIN	72	84	107	117	164

C = liner (with nut)
W = for welding
M = male part

Rubber grades, application

Rubber seals in contact with the liquid are available in two grades:

1. EPDM rubber (standard)
   This grade is temperature resistant up to 140°C but is sensitive to oil and fat. The lip seal must not be lubricated!

2. NBR rubber
   This grade is oil resistant and should replace EPDM rubber when the valves are used for margarine and butter-oil production for exam ple and for other products containing oil and fat in high concentrations.

   At high temperatures the rubber ages rapidly and becomes brittle. Max temperature should be approx 90-95°C in order that the life of the rubber does not become too short.

The rubber grades above can be used for many liquids, both in the food industry and in other industries.

Contact us in doubtful cases.

Marking

1 EPDM rubber
Marked “1” (corresponds with the last figure in the part No.)

2 Nitrile rubber
Marked “2” (corresponds with the last figure in the part No.)

Previously the EPDM rubber has not been marked and the nitrile rubber has been marked with a blue spot.

The number marking is being introduced gradually.

Storing

The rubber parts should be stored indoors and the max temperature should not exceed 30°C. (Low temp. does not damage the parts if they are warmed to room temperature before being used.)

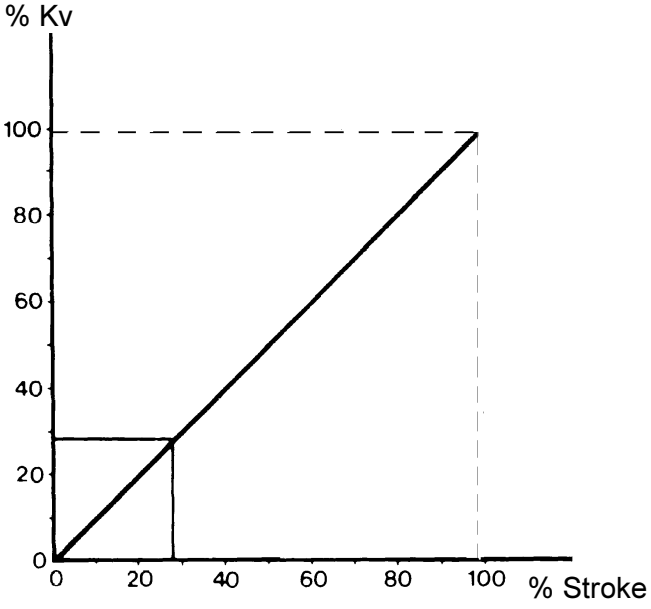
The air humidity should not be so high that condensate is formed on the parts and packages.

The rubber parts should be protected from sunlight and the ozone in the air, particularly in rooms with electric motors, fluorescent lamps or if welding is carried out in the vincinity. Cardboard boxes or black plastic bags are suitable packaging materials. The above is particularly important for nitrile rubber.

Store the parts so that they do not become deformed. Permanent deformation may occur if seal rings hang on nails or if a lip seal is provided with a tag so that the lip becomes deformed.

Rubber materials should not be stored for more than five years without being checked before being fitted.

SMO-R regulating characteristics



The Kv value is a measure of the flow in m^3/h through a completely open valve at a pressure drop of 1 bar through the valve.

Example Kv 72:
The flow is 72 m^3/h through the valve if the pressure before the valve is 1 bar and the outlet from the valve is unrestricted or, for example, 3 bar before the valve and 2 bar after.

The regulating plugs have linear characteristics which mean that a certain amount of throttling, measured as the reduction of the stroke, results in the same reduction in flow, counted in per cent, at an unaltered pressure drop through the valve.

Example Kv 72:
Pressure drop through the valve 1 bar in open position. When throttling to half open valve (50% reduction of the stroke) the flow will be reduced by 50% to 36 m^3/h if the pressure drop is not altered.

For pressure drops other than 1 bar the flow can be calculated by means of the following formula:

$Q = Kv \sqrt{\Delta p}$
(for liquids with the same density and viscosity as water)

Q = Flow in m^3/h
Kv = See above
Δp = Pressure drop in bar through the valve

Example for a valve plug Kv 72
Q is required
Δp = 2 bar

$Q = 72 \sqrt{2} = 100\ m^3/h$
Or at 50% stroke:
$Q = 0.5 \times 72 \sqrt{2} = 50\ m^3/h$

Kv values of the valves

Valve size	Kv
38	43
51	72
63.5	114
76	155
101.6	160

Conversion values

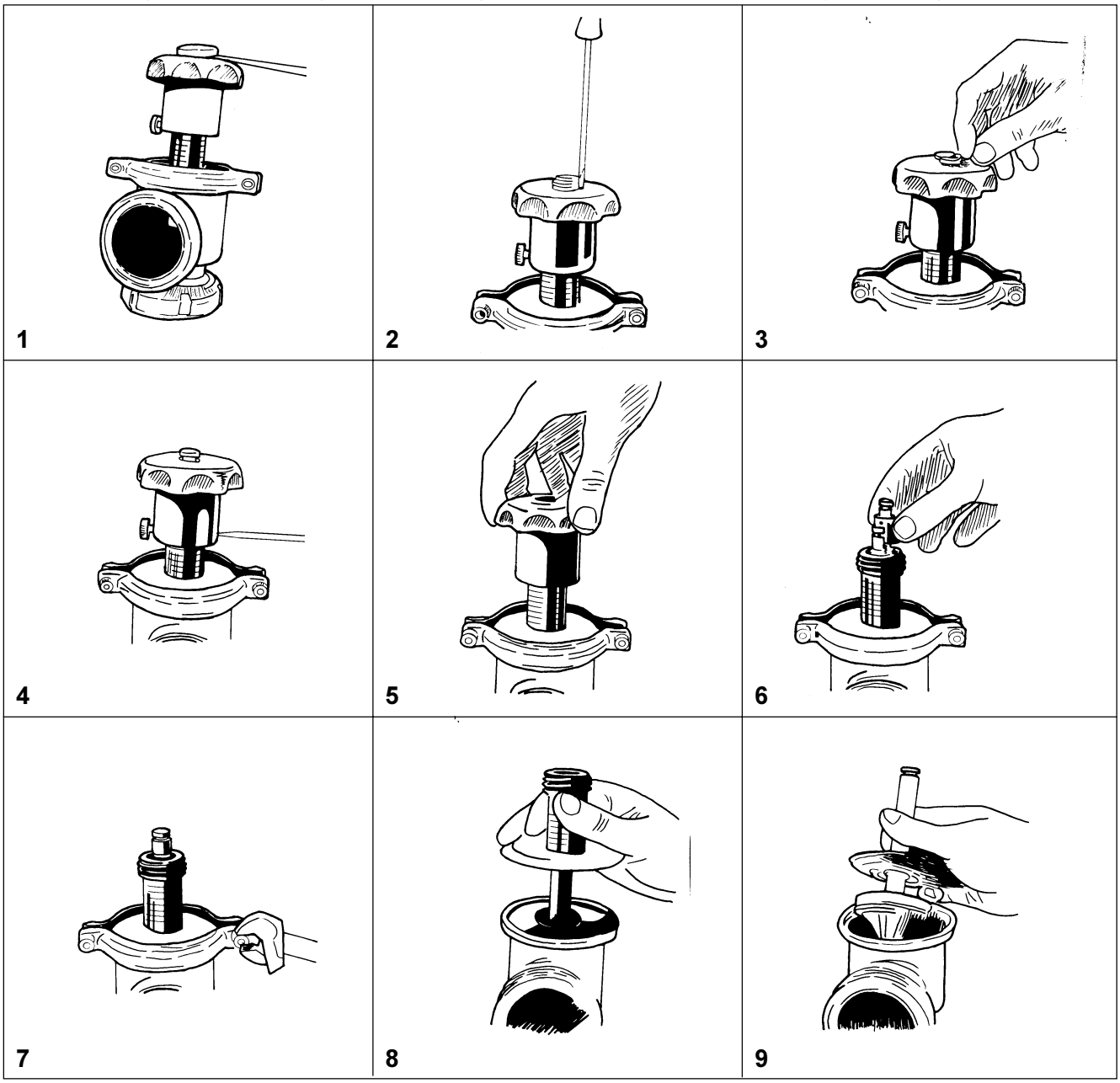
Kv = m^3/h at 1 bar pressure drop
Kv = 1/min at 1 bar pressure drop
Cv = US gall/min at 1 psi pressure drop

Kv = Cv x 0.85
Kv = kv x 0.06
Cv = kv x 0.07
Cv = Kv x 1.18
Kv = Cv x 14.22
Kv = Kv x 16.67

Dismantling and assembly

Dismantling and assembly

The operating mechanism together with plug and lip seal can be removed by loosening the clamp.



1. Pry off the cap
2. Remove the upper set screw
3. Remove the washer by pushing it sideways
4. Remove bottom set screw and lock screw
5. Unscrew the hand wheel until it comes off completely
6. Push up the plug and stem so that the stem holder comes up above the threaded part. Remove it sideways.
7. Remove the clamp by loosening the screws
8. Lift off the guide
9. Lift up lip seal and plug
10. Unscrew the screw at the bottom of the plug if the latter is to be dismantled

Dismantling and assembly

When assembling the plug: **Tighten the screw so that the parts have metallic contact**. This is simplified by applying a thin layer of silicone oil on the packing with a cloth or a spray bottle. Wipe off any silicone oil from visible rubber surfaces after assembly. The screw should be locked with Pliobond, Loctite or something similar.

Assembly takes place in reverse order.

Note!

Do not forget the lower set screw when assembling the valve. The screw acts as a stroke stop. Without this screw the valve can be opened so much that the hand wheel comes off and in some valves the flats for the spanner on the stem may enter the stem seal which will then leak.

The photographs show the operating mechanism can be dismantled without the clamp being loosened. Consequently it is not necessary to open the valve body part, which means that leakage from the valve is avoided if there is liquid in valve and pipes.

Preventive maintenance

We recommend that preventive maintenance is carried out after one year's operation in one shift.

Valve body part

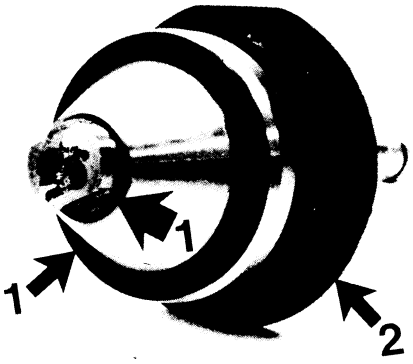
The following measures should be taken when dismantling the valve body part:

1 Exchange packing and O-ring in the valve plug.

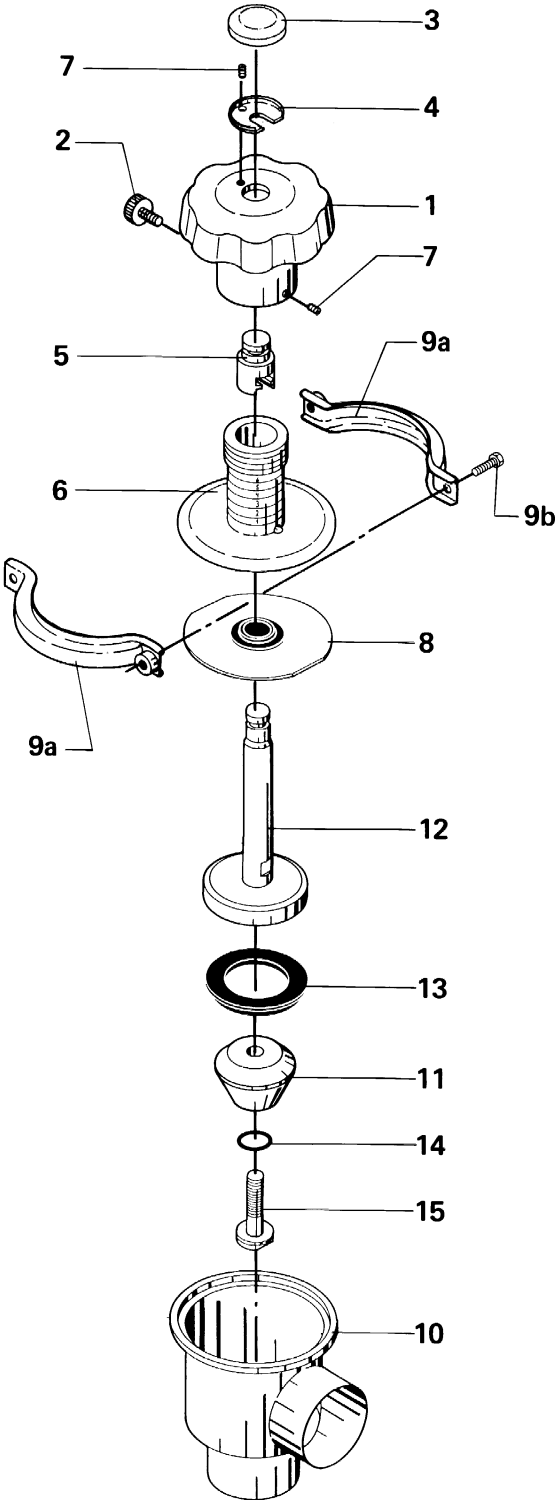
2 Check that the lip seal is not worn or has leaked. Change if necessary.

3 Check the packings in the fittings. Exchange if necessary.

For dismantling and assembly of the valve plug, please refer to "**Dismantling and assembly**".



Regulating Valve
Type SMO-R



Reg. 4.1.8 - SP70179	9202
Intro.	8301

OPERATING MECHANISM

Pos.	Qty	Denomination	NW 40 38 mm	NW 50 51 mm	NW 65 63.5 mm	76 mm	NW 80	NW 100 101.6 mm
	1	Operating mechanism compl	31353-0531-1	31353-0531-1	31353-0531-1	31353-0531-2	31353-0531-2	31353-0531-2
1	1	Hand wheel	31353-0528-1	31353-0528-1	31353-0528-1	31353-0528-1	31353-0528-1	31353-0528-1
2	1	Lock screw	31353-0529-1	31353-0529-1	31353-0529-1	31353-0529-1	31353-0529-1	31353-0529-1
3	1	Cap	31353-0468-1	31353-0468-1	31353-0468-1	31353-0468-1	31353-0468-1	31353-0468-1
4	1	Washer	31353-0467-1	31353-0467-1	31353-0467-1	31353-0467-1	31353-0467-1	31353-0467-1
5	1	Stem holder	31353-0466-1	31353-0466-1	31353-0466-1	31353-0466-1	31353-0466-1	31353-0466-1
6	1	Guide	31353-0459-1	31353-0459-1	31353-0459-1	31353-0460-1	31353-0460-1	31353-0460-1
7	2	Set screw	221581-92	221581-92	221581-92	221581-92	221581-92	221581-92

Valve Body Part

Pos.	Qty	Denomination	NW 40 38 mm	NW 50 51 mm	NW 65 63.5 mm	76 mm	NW 80	NW 100 101.6 mm
Stem Seal								
8[Δ]	1	Lip seal, EPDM	31353-0155-1	31353-0155-1	31353-0155-1	31353-0188-1	31353-0188-1	31353-0188-1
	1	Lip seal, NBR	31353-0155-2	31353-0155-2	31353-0155-2	31353-0188-2	31353-0188-2	31353-0188-2
	1	Lip seal, FPM	31353-0155-3	31353-0155-3	31353-0155-3	31353-0188-3	31353-0188-3	31353-0188-3
Clamp								
9a	2	Clamp half	31320-0022-1	31320-0022-1	31320-0022-1	31320-0021-1	31320-0021-1	31320-0021-1
9b	2	Screw	2210936-18	2210936-18	2210936-18	2210936-18	2210936-18	2210936-18
Valve Body								
10	1	Valve body, 2 ports ISO	31353-0375-1	31353-0376-1	31353-0380-1	31353-0381-1		31353-0026-1
	1	Valve body, 2 ports NW	9612-0940-01	9612-0941-01	9612-0942-01		9612-0943-01	9612-0944-01
Valve Plug								
	1	Plug compl., EPDM	31353-0520-1	31353-0521-1	31353-0522-1	31353-0523-1	31353-0523-4	31353-0524-1
	1	Plug compl., NBR	31353-0520-2	31353-0521-2	31353-0522-2	31353-0523-2	31353-0523-5	31353-0524-2
	1	Plug compl., FPM	31353-0520-3	31353-0521-3	31353-0522-3	31353-0523-3	31353-0523-6	31353-0524-3
11	1	Regulating plug	31353-0515-1	31353-0516-1	31353-0517-1	31353-0518-1	9612-0985-01	31353-0519-1
12	1	Stem	31353-0340-1	31353-0377-1	31353-0378-1	31353-0341-1	31353-0341-2	31353-0379-1
13[Δ]	1	Packing, EPDM	31353-0320-1	31353-0321-1	31353-0322-1	31353-0324-1	9612-0950-01	31353-0325-1
	1	Packing, NBR	31353-0320-2	31353-0321-2	31353-0322-2	31353-0324-2	9612-0950-02	31353-0325-2
	1	Packing, FPM	31353-0320-3	31353-0321-3	31353-0322-3	31353-0324-3	9612-0950-03	31353-0325-3
14[Δ]	1	O-ring, EPDM	990034-01	990034-01	990034-01	990034-01	990034-01	990034-01
	1	O-ring, NBR	223404-21	223404-21	223404-21	223404-21	223404-21	223404-21
	1	O-ring, FPM	223404-35	223404-35	223404-35	223404-35	223404-35	223404-35
15	1	Screw	31353-0514-1	31353-0514-1	31353-0514-1	31353-0514-1	31353-0514-1	31353-0514-1
[Δ]		Service Kit EPDM	9611-92-0010	9611-92-0013	9611-92-0016	9611-92-0019	9611-92-0105	9611-92-0022
[Δ]		Service Kit NBR	9611-92-0011	9611-92-0014	9611-92-0017	9611-92-0020	9611-92-0106	9611-92-0023
[Δ]		Service Kit FPM	9611-92-0012	9611-92-0015	9611-92-0018	9611-92-0021	9611-92-0107	9611-92-0024

Parts marked with [Δ] are included in the service kits.

Recommended spare parts: Pos. 3,7 and Service Kit.

How to contact Alfa Laval
Contact details for all countries
are continually updated on our website.
Please visit www.alfalaval.com to
access the information direct.