



AUTHORISED  
EXPORTER  
N° IT/004/BI/15

**italvalvole®** s.a.s.

di SPADON OSCAR & C.

Guide to selection, operation and maintenance  
IVSM-IVFLM Series hand-operated valves

CODE 7462  
CATEG. 1716  
GROUP 900  
REVISION 05  
DATE 19/07/2016

# ON-OFF VALVES

## SERIES IVSM-IVFLM (hand-operated)

### FAMILY 01 - GROUP 91,92

Master handbook description: Guide to selection, operation and maintenance of IVSM-IVFLM series hand-operated valves (English)

Code : 7462  
Category : 1716  
Group : 900  
Revision no.: 05  
Date : 19/07/2016  
Drawn up by: MN  
Checked by: MB  
Approved by: OS



IT AEOF 15 0974



ISO 9001 - Cert. n° 0302



Cert. PED N° 002-97/23/CE-D  
Cert. PED N° PA001-97/23/CE-B

DIRECTIVE 2014/34/EU  
CERTIFICATE N° 0425 ATEX 2519  
CERTIFICATE N° 0425 ATEX 1318



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## 1 Foreword

The IVSM and IVFLM on-off valves have been designed to meet multiple operating needs which are peculiar to current users and which increasingly concern future users. For their building characteristics they lend themselves to be used mostly in the following fields: textile, dyeing, tannery, chemical companies, food companies and in general in all those environments that for reasons of humidity and chemical aggressiveness do not tolerate any other material but stainless steel.

The particular ease of maintenance, the Teflon seal on the stem, the use of pressed and microfused components make of these valves one of the most industrialised products of the sector. The IVSM-IVFLM series on-off valves are available in ND 15 – 150. The IVSM acronym refers to the valve with angle pattern body, the IVFLM acronym refers to the valve with 45° angle pattern body.

Classification according to directive 2014/68/UE : Article 4, paragraph 3 .

Table 2 includes a list of fluids which are perfectly compatible with valves.

For any other fluid or use, which has not been expressly indicated in this manual, contact directly our service department.

## 2 Technical Characteristics

<i>General notice:</i>	⇒ all the pressure values indicated hereinafter are gauge pressure values. Normal operation with pressure under obturator.
	⇒ <b>valve destined to fluids of group 2 (directive 2014/68/UE).</b>
<i>ND:</i>	⇒ 15 to 125
<i>Connections:</i>	⇒ to be butt welded.
	⇒ flanged in compliance with UNI PN 6, PN 10, PN 16, (flanges can be flat, pressed or pressed revolving)
	⇒ GAS threaded, both internal and external.
<i>Pmax allowable (PS):</i>	⇒ 16 bar (ND 15-50); 10 bar (ND 65-80); 6 bar (ND 100-125).
<i>Pmin allowable:</i>	⇒ 0 bar.
<i>Seal:</i>	⇒ EPDM, PTFE-coated EPDM.
<i>Tmax allowable:</i>	⇒ 130 °C with EPDM seal; 155° with seal in PTFE-coated EPDM.
<i>Tmin allowable.:</i>	⇒ -10 °C (liquid phase).
<i>Flow direction:</i>	⇒ 2-way globe valve, with angle and oblique pattern body, unidirectional.
<i>Working materials:</i>	⇒ see working drawings and relevant tables.
<i>Overall dimensions:</i>	⇒ see overall dimensions drawings and relevant tables.



## 2.1 Table 1: Kv Of IVS-IVFL Valves

ND		$\Delta P$ [ bar]	Kv [ m <sup>3</sup> /h ]	ND		$\Delta P$ [ bar]	Kv [ m <sup>3</sup> /h ]
15	IVS	1	2	50	IVS	1	34
	IVFL		2		IVFL		35
20	IVS	1	6	65	IVS	1	74
	IVFL		6.5		IVFL		76
25	IVS	1	12	80	IVS	1	125
	IVFL		14.5		IVFL		132
32	IVS	1	15	100	IVS	1	-----
	IVFL		18		IVFL		-----
40	IVS	1	21	125	IVS	1	-----
	IVFL		22		IVFL		-----

## 2.2 Table 2: Compatible Fluids

Type of fluid	Type of seal	
	EPDM	PTFE- coated EPDM
Vinyl acetate	YES	YES
Glycerol fatty acids	NO	YES
Phenol	NO	YES
Phosphoric acid 20% max.	YES	YES
Phthalic acid	YES	YES
Gallic acid	NO	YES
Nitric acid 5% - 65% max	NO	YES
Tannic acid	YES	YES
Ethanol	YES	YES
Methanol	YES	YES
Propanol	YES	YES
Aniline	NO	YES
Sodium carbonate 20% max	YES	YES
Borax (sodium tetraborate)	YES	YES
Sodium carbonate	YES	YES
Potassium chlorate 30% max	YES	YES
Sodium chloride 20% max	YES	YES
Potassium chloride 5% max	YES	YES
Ethylene glycol	YES	YES
Ammonium nitrate	YES	YES
Copper nitrate	YES	YES
Sodium nitrate	YES	YES
Ethylene perchlorate	NO	YES
Potassium sulphate 20% max at T=100 °C	YES	YES
Sodium sulphate	YES	YES
Zinc sulphate 40% max at T=100 °C	YES	YES
Potassium sulphite 10% max	YES	YES
Sodium sulphide	YES	YES
Toluene	NO	YES
Steam T <sub>max</sub> =130 °C P = 2.7 bar	YES	YES
Steam T <sub>max</sub> =150 °C P = 4.8 bar	NO	NO

All data indicated under table 4, if not otherwise specified, are relevant to a temperature of 21°C.

All data are general and are not valid for all possible working conditions. These data may considerably vary depending upon various conditions, such as: temperature, concentration, fluid speed.

For a deeper and thorough information, please get in touch with the technical department.

Any use of the valve on explosive, easily inflammable, comburent and poison gases is strictly forbidden.

Any use of the valve on liquids based on: chlorine, fluorine, bromine, iodine and derivative elements is strictly forbidden.

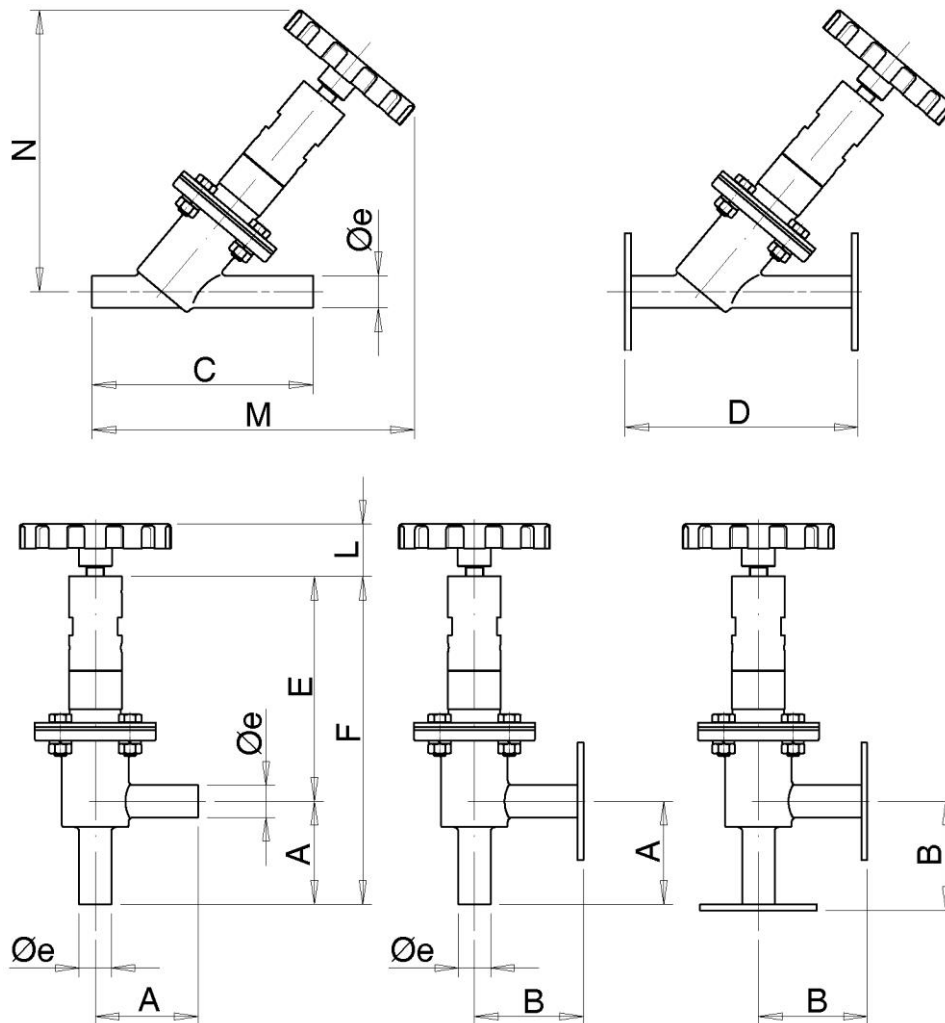
Any deviation from such prohibitions may be issued for special applications, by our technical department, upon written request.

## 2.3 Safety Notes

- The VALVE body, under the maximum operating temperature depending upon the system, may reach a temperature T equal to 155 °C. It is up to the engineer to provide the system with the necessary safety guards and/or warning signals aiming at removing/indicating the risk of possible burns by the user.
- Each valve is equipped with 2 inspection holes (positioned on the casing). They are used as warning signal in case of leakages from the stem seal. It is up to the engineer to provide the system with the necessary safety guards and/or warning signals aiming at removing/indicating the risk of contact with probably dangerous fluids by the user.
- During whatever operation made on the valve, the fluid shall not be present inside the piping.

## 2.4 Overall Dimensions Of IVS-IVFL Hand-Operated Valves

### 2.4.1 IVS-IVFL Hand-Operated; Group: 91, 92



Drawing No. 020317 Rev.: 00

ND	15	20	25	32	40	50	65	80	100	125
$\varnothing e$ pipe	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7
A	68	68	78	88	98	113	130	133	148	163
B	70	70	80	90	100	115	130	135	150	165
C	146	146	156	176	196	226	290	306	345	395
D	150	150	160	180	200	230	290	310	350	400
E	148.5	148.5	148.5	157.5	158.5	197	214	192	204	351.5
F	216.5	216.5	226.5	245.5	256.5	310	344	325	352	514.5
L	34.5	34.5	34.5	30.5	36	58	58.5	53.5	52	61.5
L <sub>1</sub>	54.5	54.5	54.5	50.5	56	78	78.5	75	80	96.5
M	213	208.5	197	211	230.5	305.5	350	367.5	407.5	480
M <sub>1</sub>	226	221	210	224	243.5	318.5	364.5	382.5	427.5	503
N	185.5	188.5	185.5	193	204	272.5	292	304.5	325.5	412
N <sub>1</sub>	201	204.5	201	208	219.5	288	306	320	345.5	439

Dimensions corresponding to the letters with subscript 1, refer to the position of the completely open valve handwheel.

Dimensions are in millimetres

## 3 Storage, Assembly, Check And Maintenance

### 3.1 Transport, Storage And Handling

IVS-IVFL on-off valves, during transport and assembly, must be handled very carefully. Shocks and anomalous stresses must be avoided.

Valves shall be supplied provided with dust-proof protections on all connections, which shall not be removed until the valve is assembled on the system.

Valves shall be stored in areas which are not exposed to the sunshine, so as to prevent inner gaskets from getting dry and old before time.

Storage temperatures shall range between 0 °C and +50 °C.

### 3.2 Assembly Instructions

#### 3.2.1 General

The valve installation on the system shall be carried out by qualified personnel only, within the hydraulic and pneumatic fields, provided with all the equipment normally used in the industrial hydraulic and pneumatic plant engineering. The personnel shall always wear proper accident prevention garments, taking particular care to the protection of face, eyes and hands.

In no case the valve must be disassembled or modified, under pain of revocation of each type of guarantee.

Before assembly, dust-proof protections shall be removed from the valve body.

During the valve cleaning operations, do not blow compressed air into the inspection holes.

#### 3.2.2 Assembly Of Flanged Valves

In case the body has flanged ends, a gasket shall be interposed between valve and pipe flanges, so as to guarantee a perfect seal; furthermore, flange fastening screws shall be tightened to the prescribed torque, in compliance with the plant characteristics and the mechanical requirements of the valve PS.

#### 3.2.3 Assembly Of Valves With Butt Welding Ends

In case of bodies having butt welding ends, before starting welding, the whole servo control complete with its gasket shall be removed, so as not to damage it during welding. In order to properly perform the assembly and disassembly operations, operate as follows:

- 1) Unscrew the handwheel and open the valve.
- 2) Unscrew the screws fastening the cover to the valve body.
- 3) Remove the servo control from the body.
- 4) Extract the gasket from the body.

Welding must be carried out considering the material of the valve body and the required thickness, as ruled by the provisions in force for the whole system.

#### 3.2.4 Assembly Of Valves With Female Threaded Connections (special version).

In case the body is provided with female threaded connections, the ends of connection pipes are to be sealed with PTFE tape, so as to guarantee a perfect seal; besides, it is necessary to tighten to the prescribed torque the connections as specified hereinafter, in table 3.

**Caution:** the installer shall verify that all the parts connected to the valve can support the required tightening torque.

#### 3.2.5 Assembly Of Valves With Male Threaded Connections (special version).

In case the body is provided with male threaded connection, said areas are to be sealed with a PTFE tape so as to guarantee a perfect seal; besides, it is necessary to tighten to the prescribed torque the connections as specified hereinafter, in table 3.

**Caution:** the installer shall verify that all the parts connected to the valve can support the required torque.

In order to prevent foreign matters (welding slags, chips and others), present in the pipes, from damaging the valve seat, before operating the valve, open it completely and make the fluid pass through at the maximum operating pressure of the system, so as to clean the pipe.

### 3.3 Troubleshooting

Troubleshooting operations shall be always carried out by qualified personnel only, adequately equipped for the hydraulic and pneumatic operations and provided with the proper safety clothing, paying particular attention to the protection of face, eyes and hands.

In case of anomalous operation or valve leakages, the valve operation shall be immediately stopped and the following checks shall be carried out:

**Caution:** during troubleshooting, the valve shall not be removed, nor placed elsewhere. No components of the valve shall be disassembled or unloosened.

Check, by means of a pressure gauge, that the pressure of the valve inlet fluid (before the valve) is not higher than the maximum allowable pressure.

Should anomalies still be present after this check, valve inner parts are to be verified, disassembling the valve as indicated under the "Instructions for disassembly, gasket replacement and re-assembly of N. C. valves" of this manual.

Should leakages still persist, contact our technical department.

### 3.4 Scheduled Maintenance

Scheduled maintenance operations shall be carried out apart from the ones due to possible failures, which always need an immediate intervention.

The time interval between one maintenance operation and the following shall be included in the lower time interval between the one corresponding to 50.000 cycles and three years; it consists of a complete disassembly of the valve, replacement of all the gaskets and a complete cleaning of all other components. For disassembly and re-assembly operations, make reference to the relevant paragraphs of this manual.



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## 3.5 Instructions For Disassembly, Gasket Replacement, Reassembly Of IVS-IVFL Hand-Operated Valves

For the disassembly and assembly operations of valves, refer to the annexed Dwg. no. 020314.

All the disassembly and assembly operations shall be carried out by qualified personnel, adequately equipped for the hydraulic and pneumatic and provided with the proper safety equipment. Before carrying out any operation on systems and valves, get acquainted with operating temperatures and pressures and any other particular conditions.

Whenever operations are to be carried out on valves, remove the fluid completely. The valve body shall be completely empty.

**NOTE: Read the procedures thoroughly before starting any operation.**

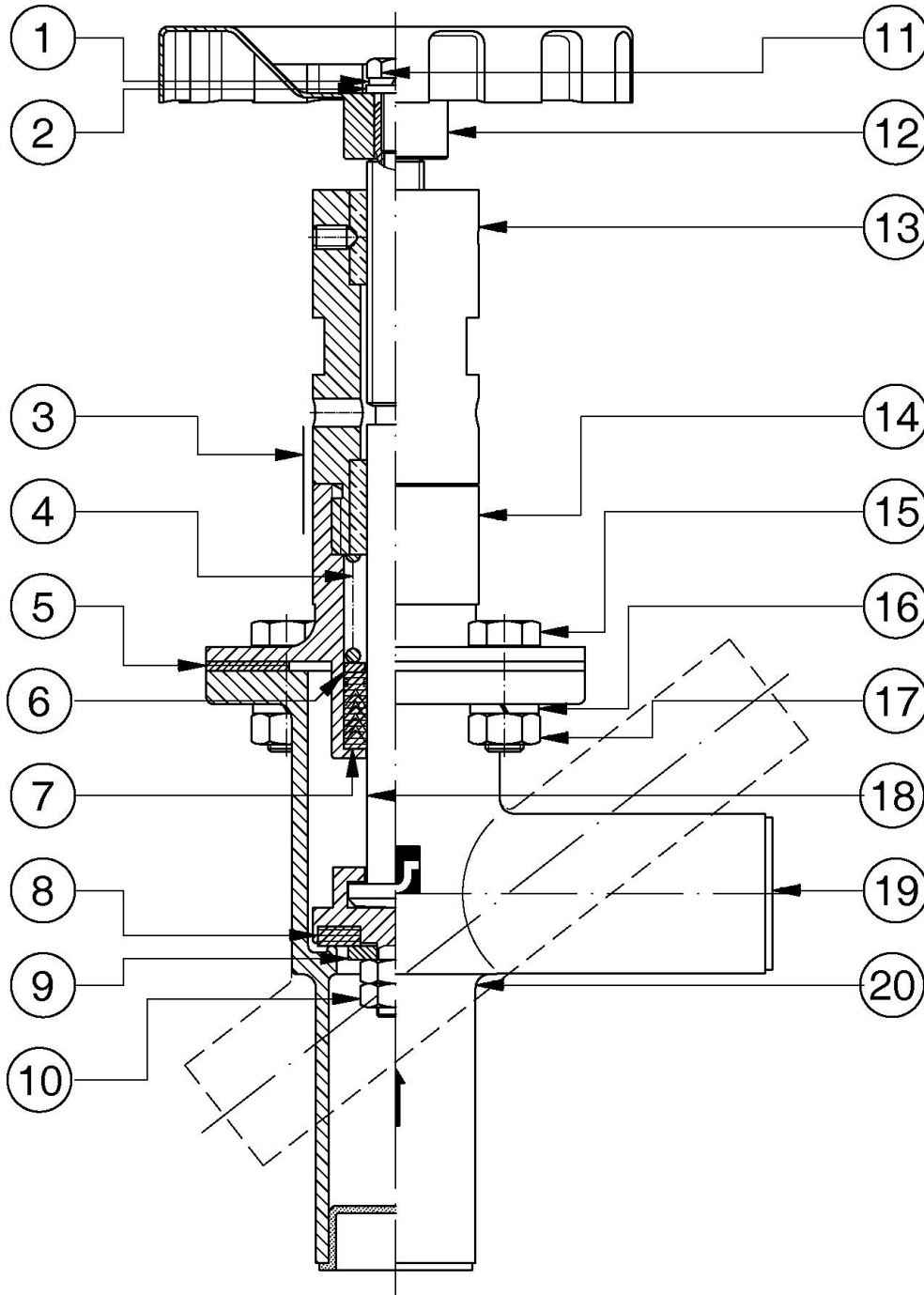
### 3.5.1 Disassembly

- 1) Unscrew nuts (17), extract washers (16), remove screws (15).
- 2) Separate the servo control from the valve body (20).
- 3) Extract the body gasket (5).
- 4) Unscrew the screw (11), extract the spring washer (1) and the flat washer (2).
- 5) Remove the handwheel (12).
- 6) Unscrew and remove the hand-operated shaft (18).
- 7) Unscrew the nut (10) and the relevant lock nut.
- 8) Extract the cap retaining washer (9).
- 9) Remove the cap (8).
- 10) Unscrew the servo control casing (13) and separate it from the servo control cover (14). **Caution! The servo control casing (13) keeps the packing gland spring (4) compressed**; therefore, be extremely careful to avoid the sudden expulsion of the spring during the disassembly operations.
- 11) Remove the packing gland spring (4).
- 12) Extract the spacer washer (6) and the packing gland pack (7).
- 13) Now the valve has been completely disassembled, so that the required components can be replaced.

### 3.5.2 Assembly

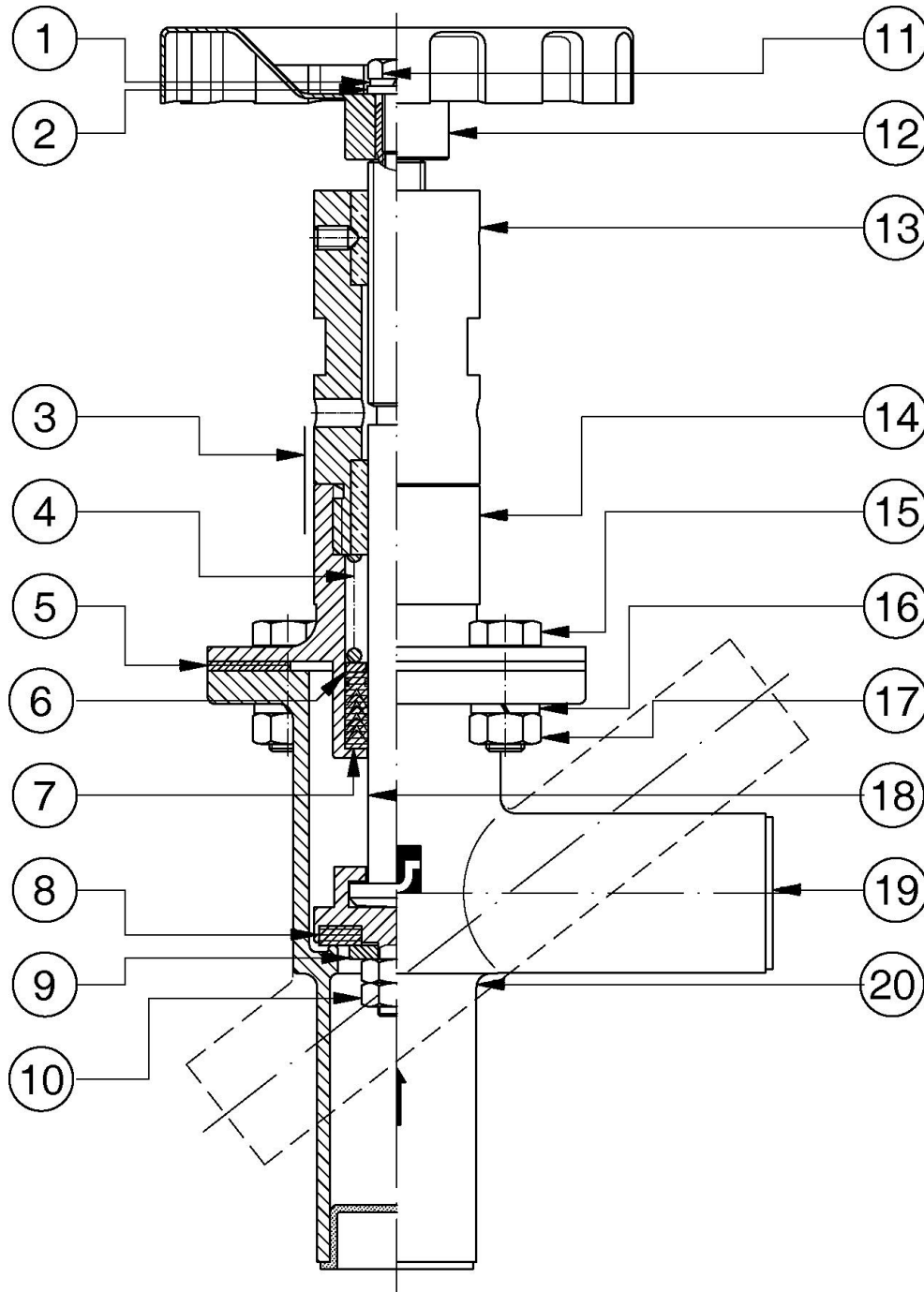
- 1) Fit, into the servo control cover (14), the packing gland pack (7), the spacer washer (6) and the packing gland spring (4).
- 2) Tighten to the prescribed torque, as specified in table 3, the servo control casing (13) with the servo control cover (14).
- 3) Install the cap (8) and the cap retaining washer (9) on the cap holder of the hand-operated shaft (18).
- 4) Tighten to the prescribed torque, as specified in table 3, the nut (10) and the relevant lock nut.
- 5) Fit the so assembled hand-operated shaft (18) into the servo control cover (14) and screw it until the whole milled part of the shaft has gone out of the servo control casing (13).
- 6) Fit the handwheel (12) onto the hand-operated shaft (18).
- 7) Position the flat washer (2) and the spring washer (1).
- 8) Tighten to the prescribed torque, as specified in table 3, the screw (11).
- 9) Unscrew the handwheel as much as it is necessary to move the cap holder near the servo control cover.
- 10) Rest the body gasket (5) on the valve body (20).
- 11) Fit the servo control into the valve body (20).
- 12) Fit screws (15) into the relevant holes.
- 13) Fit spring washers (16) on them and tighten to the prescribed torque, as specified in table 3, nuts (17).

3.5.3 Exploded View Of IVS-IVFL Hand-Operated Valves



Drawing No. 020314 Rev.: 00

## Exploded View Of IVS-IVFL Hand-Operated Valves



Drawing No. 020314 Rev.: 00

### 3.6 Components And Spare Parts For IVS-IVFL Hand-Operated Valves

PART	Q.ty	DESCRIPTION	MATERIAL	GROUP	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	
1	1	Spring washer	AISI 304	503	RE0600304									RE0800304	
2	1	Flat washer	AISI 304	602	RP0600304									RP0800304	
3	1	Self-sticking rating plate	POLYETH.	506	EAITA4324										
4	1	Packing gland spring	AISI 316	552	MTD086111				MTD088162			MTD088172		MTD088163	
5	1	Body gasket	••••	511	GUAR950928			GUAR950929	GUAR950930	550	GUAR030117	552	553	554	
6	1	Spacer washer	AISI 316	703	RDD086297					RDD088157					RDD092180
7	1	Packing gland	TEF/TEGR	587	PT01222TT					PT01626TG					PT02236TG
8	1	Cap	EPDM	511	2613	537	538	539	540	541	542	543	544		
			EPDM/PTFE	818	TDRD90332		TDRD90333	TDRD90334	TDRD90335	TDRD90336	TDRD90337	TDRD90338	TDRD90339	TDRD90340	
9	1	Cap stop washer	AISI 316	526	RPU6592066	RFD000127	RFD000116	RFD000117	RFD000118	RFD000119	RFD000120	RFD000121	RFD000122	RFD000123	
10	•	Hexagon nut	AISI 316	501	D06055896	D08055896			D10055896			D08055896			
11	1	Hexagonal-head screw	AISI 304	500	VTE061604						VTE062004		VTE081604		
12	1	Handwheel	AISI 304	662	VPSD93192					VPSD93312					
13	1	Servo control casing	AISI 304 BRASS	570	CSD093194					CSD090482					CSD090483
14	1	Servo control cover	AISI 316	846	FFCD93195			FFCD90472	FFCD93196	FFCD90474	FFCD90475	COPE090476	FFCD90477	FFCD90478	
15	••	Hexagonal-head screw	AISI 316	500	VTE082206					VTE082506		VTE083006	VTE103504		
16	••	Spring washer	AISI 304	503	RE0800304									RE1000304	
17	••	Hexagon nut	AISI 304	501	D08055884									D10055884	
18	1	Hand-operated shaft	A	AISI 316	652	NAMD93301	NAMD93302	NAMD93207	NAMD93296	NAMD93208	NAMD93985	NAMD93299	ALMP970880		
			F	AISI 316									ALMP950352	NAMD93450	NAMD93300
19	2	Cylindrical cap	POLYETH.	505	T01ST00160	T01ST00230	T01ST00285	T01ST00395	T01ST00440	T00000535	T01ST00730	T01ST00850	T01ST01110	T013PT0125	
20	1	Valve body	A	AISI 316	•••	M316950238	M316950244	M316093104	M316940103	M316950400	M316950402	M316010501	SUD001039	SUD001040	SUD000496
			F	AISI 316		M316950241	M316950245	M316093943	M316940102	M316950399	M316950401	M316010502	FLD001043	FLD001044	FLD001147

A= ANGLE; F= FREE FLOW

- Q.ty 2 from ND 15 to ND 65; Q.ty 6 ND 80; No. 8 ND 100 and ND 125
- Q.ty 4 from ND 15 to ND 32; Q.ty 8 from ND 40 to ND 125
- Group 841 from ND 15 to ND 65; Group 515 from ND 80 to ND 125 (Free flow valves); Group 519 from ND 80 to ND 125 (Angle valves)
- TESNIT-BAU from ND 15 to ND 50 and from ND 80 to ND 125 – EPDM reinforced by NYLON for ND 65

## GROUP 94

COMPLETE SET OF SPARE PARTS FOR HAND-OPERATED STAINLESS STEEL VALVES

SPARE PART CODE	EPDM	7318		7319	7320	7321	7322	7323	7324	7325	7326	
	T. C.	7327		7328	7329	7330	7331	7332	7333	7334	7335	
PART NO.	Q.ty	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125	
4	1	MTD086111				MTD088162			MTD088172		MTD088163	
5	1	GUAR950928			GUAR950929	GUAR950930	550	GUAR030117	552	553	554	
7	1	PT01222TT					PT01626TG					PT02236TG
8	EPDM	1	2613	537	538	539	540	541	542	543	544	
	T. C.		TDRD90332	TDRD90333	TDRD90334	TDRD90335	TDRD90336	TDRD90337	TDRD90338	TDRD90339	TDRD90340	

## 4 Table 3: Tightening Torques

Combination of components	Tightening torque for stainless steel valve threaded couplings [ Kg·m ]									
	ND 15	ND 20	ND 25	ND 32	ND 40	ND 50	ND 65	ND 80	ND 100	ND 125
<b>P. 10 P. 18</b>	0,65	1,5			3		1,5			
<b>P. 11 P. 18</b>	0,65									1,5
<b>P. 13 P. 14</b>	6,9				26,9				30,0	
<b>P. 15 P. 17</b>	1,5							3		

## 5 Disposal

After use, for the valve disposal, it is necessary to disassemble the valve and separate the different materials the valve is composed of, according to the tables annexed to the valve working drawings, then dispose of the different materials in compliance with the laws in force.

### WARNINGS:

- Safety conditions ca not be warranted and wrong workings can not be attributed to our valves if:
  - Disassembly, assembly and maintenance operations are not carried out following the instructions described in this manual.
  - Original spare parts are not used.
- It is forbidden to remove pages from this document or to make any correction.
- In case of doubt, make reference to Italian version of the manual.
- ITALVALVOLE® S.A.S. reserves the right to make modification and/or amendment to its products and relevant documentation without giving notice.
- The use of the handbook does not exempt from the observance of the laws in force.