ISOIL IMPIANTI

OPERATOR'S MANUAL

SBM 75
P.D. METER
ALUMINIUM EXECUTION

CODE:	**MA/026/00/EN**
REV:	**04A**
DATE:	**07/2009**

ISOIL IMPIANTI spa – Italy

Sede e Stabilimento
Head office and factory
24061 Albano S. Alessandro (BG)
74, via Madonna delle Rose
Tel. +39 035 4239.011
Fax +39 035 582078
E-mail: albano@isoil-impianti.it
www.isoilmeter.com

Uffici commerciali
Sales office
20092 Cinisello Balsamo (MI)
27, via F.lli Gracchi
Tel. +39 035 4239.011
Fax +39 02 66012457
E-mail: sales@isoil-impianti.it

Sede legale
Registered office
20124 Milano
24, viale Vittorio Veneto
Capitale soc. i.v. Euro 774.00
Codice fisc. E part. IVA 13066900153
C.C.I.A.A. MI – Reg. Impr. 86449/2000

OPTIONAL:

Strainer air separator
Preset valve + check
Calibrating mechanism for mechanical counter
Gearing box for electronic counter VEGA

ENCLOSED:

ISOIL IMPIANTI updates own products without condition of advance notice. ISOIL IMPIANTI doesn't take liabilities for use the dates that are modified

1 Introduction

1.1 Warranty

Each device comes with a 1-year warranty, starting from the delivering date.
Such warranty of good operating of the equipments includes our efforts of repairing or replacing, in the shortest time, the parts that fail for defective manufacturing or material during the warranty period, without rights to any refund for damages or other expenses.

If a device is going to be transferred in our laboratory for repair, the delivery expenses is at the customer's expense.

For any inspection of our qualified personnel related to what stated above, the labor is at our expenses, while the board, lodging and travel expenses are in charge at the customer.
The components furnished and installed, but not produced, by Isoil
Impianti S.p.A.are covered by the guarantee released by the respective producers.

The warranty ceases if non-original spare parts are used; the warranty ceases too for an improper use or if the operational limits of the device are exceeded.

1.2 Introduction

ISOIL positive displacement meters are precision measuring instruments designed for use with a variety of petrochemical products and liquids. Each meter is fully tested and calibrated by factory before dispatch, and a regular service will maintain a high standard of performance and accuracy.

P.D. meters must be periodically tested by a calibrating tank, Prover, or Master Meter: if out of accuracy a service is necessary.

Experience has shown that mechanical defects are usually caused by the entry of foreign matters into the metering compartment due to inadequate straining facilities in the pipeline.

Special tools have been designed to facilitate overhaul operations and their use is recommended.

1.3 Working principles

Liquid enters the meter through the manifold and causes the rotor to revolve by pressure on the vanes. (fig.1)

The proximity of the rotor to the front and rear of the casing forms an efficient seal while the profile of the casing guides the vanes on to the measuring crescent.

The seal between vane and body is assured by the combined effects of gravity and centrifugal forces of vanes and it is assured the self-balance of clearances generated by the use too.

The rotor spindle extends through a pressure tight seal in the meter front cover into the calibrating mechanism which transmits the rotor movement to the register.

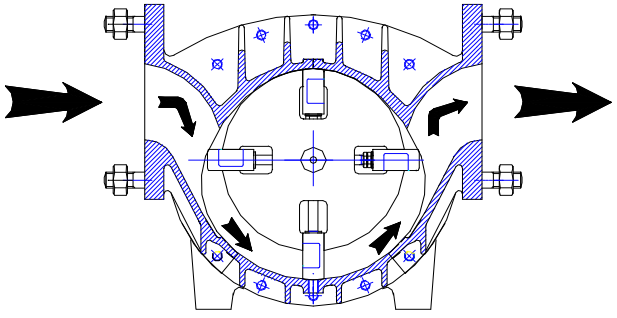


Fig.1

CAUTION

All parts under pressure must be released before disassembling the meter or its accessories for adjustment, inspection, servicing or substitution of its components.

Also make sure that all electric or electronic part, if present, are disconnected from its power supply.

2 General safety principles

This operator's manual contains basic safety instructions that must be followed during system installation, operation and maintenance. Failure to comply with these instructions may result in personal injury and can lead to personal, industrial or environmental accidents. Some examples of possible hazards caused by non-compliance with these instructions are:

- Failure of the system and/or some components
- Hazards to people caused by the exposition to electrical, mechanical or chemical influences
- Pollution of the environment through the leaking of hazardous substances

Therefore, follow the safety instructions described in this manual; in case of uncertainties, please contact the manufacturer.

2.1 General instructions

- Read carefully the operator's manual.
- Make sure that all the personnel assigned to the installation, operation and maintenance is properly trained.
- Make sure that the contents of the operator's manual are completely understood by all personnel assigned to the operations on the system.
- Inspect parts under pressure in compliance with national regulations before the initial operation of the system.
- Make sure that the operator's manual is readily available to personnel on site.
- Follow national safety regulation in force in the location of the plant.
- Make sure that the system operates in compliance with the relevant operational limits.
- All pressure parts must be inspected and serviced in accordance with national laws in force.

2.2 Meter operation

- The meter must be operated only by trained and authorized personnel.
- The meter must not be operated in presence of foreign, unauthorized or not adequately trained personnel.
- The meter must be used for the purpose it is made for; the manufacturer is not responsible for any damage deriving from uses outside of the original purposes.
- The meter must be operated inside the limits fixed by the manufacturer; the manufacturer is not responsible for any damage deriving from uses outside of the operational limits of the device.

2.3 Instructions for the operator

- The operator must adhere to safety and accident-prevention standards currently in force in the country where the device is installed.
- The operator must not, by his own initiative, carry out any operation that is outside his competence.
- The operator must carefully comply with hazard and/or prohibition instructions contained in this manual.
- Do not use petrol, solvents or other flammable substances to clean parts. Use only approved commercial solvents that are non-flammable and non-toxic.

2.4 Servicing instructions

- Never carry out any maintenance, servicing or regulation before having closed the root valve, discharged the pressure from the system and disconnected the power supply to any electrical device (if present), unless explicitly stated otherwise.
- Read carefully the rating plates on the individual equipment.
- All maintenance operations, either ordinary or extraordinary, must be done by authorised and trained personnel.
- The maintenance operator must wear clothes adequate to the working environment and to the situation; in particular, loose or voluminous clothes, chains, bracelets, rings, earrings or anything that might get caught in the mechanical parts of the system should be avoided.
- The maintenance operator must wear adequate protective devices in accordance with safety and accident-prevention regulations.
- In explosive environments use only antisparking equipment.
- If the meter is connected to any electric or electronic equipment, disconnect all of them from the power supply before doing any servicing or regulation operation, unless explicitly stated otherwise in the manual.

2.5 Operating precautions

- The meter must always remain full of product; to achieve this, it is suggested to install the meter so that it remains below the main line.
- The line upstream the meter must be kept full of product to avoid that some air enters the meter.
- Each meter must be adjusted following the instructions supplied in the operator's manual.
- Follow the recommendations of the manufacturer when installing pumps. Pay particular attention to factors such as the use of foot valves, inlet pipes dimension and conformity with nPSH when there are suction pumps. Follow the recommendations of the manufacturer to minimize the problems due to air and vapors.
- For flashing liquids (quick gasification of the liquid) or easily vaporizing liquids at high environmental temperatures, e.g. light hydrocarbon, it is advisable the use of submerged aspirations and pipes larger than the nominal dimension of the pump.
- Thermal expansions that generate overpressures can easily damage the meters and the systems in general. Put safety valves for overpressure in every section that can be closed through regulation or isolation valves.

CAUTION

All parts under pressure must be released before disassembling the meter or its accessories for adjustment, inspection, servicing or substitution of its components.

Also make sure that all electric or electronic part, if present, are disconnected from its power supply.

3 Installation

3.1 Precautions

The installation of the meter counter does not require any special procedure; just pay attention to the following points:

- The meter counter must be installed horizontally; for other applications a vertical arrangement is provided. In both cases the rotor axis must be kept horizontal.
- All the meter's openings are protected with covers when shipped; those must not be removed until the meter is installed on the piping
- Before the installation of the meter, it's suggested to clean thoroughly the piping to remove dirt, crusts and other foreign particles.
- Piping should not exercise strain on the meter. The meter is designed for overhang and supports should be provided only on the adjacent pipes.
- Leave space enough around the meter to ease access for adjustment, servicing and disassembly. The counter, if present, must be easily readable.
- The meter must always remain full of product; it's suggested to install the meter so that it remains always under the main line.
- The line upstream the meter must always remain full of product to avoid that air enters the meter's measure chamber; if the pipe arrangement allows reversal flow, a non-return valve must be installed.
- Flow through the meter must be regular and uniform; pulsating and irregular flows must be avoided.
- It is recommended to install flow limiting valves downstream of the meter if the flow rate can reach values higher than the maximum allowed for the meter.
- If the line pressure can reach values higher than the maximum allowed, automatic safety valves must be installed in adequate places.
- To protect meter from damages due to foreign particles in the liquid, a suitable strainer with a correct mesh number (40 mesh for oil, 60 mesh for diesel oil, 100 mesh for gasoline) must be installed upstream the meter.
- In case the rate of flow through the installation exceeds the meter maximum rated capacity, it is advisable to use a flow limiting valve, which must be installed downstream the same meter.
- Water must not flow through the meter.

- Meters must be installed in such a way that air or vapour do not enter through the liquid under measurement. It is always suggested to install an air separator just upstream the meter.
- To avoid hammer shocks which may strongly damages the meter, it is not advisable to install upstream or downstream the meter any quick closing valves.
- It is recommended to install root valves at the inlet and outlet to ease servicing operations and isolation of the meter.

3.2 Start-up precautions

- Before proceeding with the start-up make sure that:
  - The meter is adequately fixed.
  - All the connections are tightened.
  - Air is bled from the pipes.
- If a calibration mechanism is associated with the meter, before the start-up it must be filled with lubricating oil.
- Vent out all the air eventually present in the line.
- When the meter is operated for the first time, fill it slowly with the operating fluid by following this procedure:
  - Open slowly the upstream isolation meter or fill the meter by gravity.
  - Open slowly the downstream isolation meter letting the flow rate rise smoothly to the operating value.

CAUTION

Be very careful when starting up the meter: if the air enters the measuring chamber the rotor can easily reach high rotational speeds, leading to abnormal wear of the vanes and other components; this, in turn, will lead the meter to a major failure.

CAUTION

All parts under pressure must be released before disassembling the meter or its accessories for adjustment, inspection, servicing or substitution of its components.

Also make sure that all electric or electronic part, if present, are disconnected from its power supply.

4 Maintenance

Before removing the flow meter from the pipeline for repairs, it is recommended that the possible causes and corrective actions are noted with the help of Fault Diagnosis Chart given in this manual.

Note that certain components in the flow meter assembly are not interchangeable. Therefore, if more that one flow meter is dismantled, it is recommended that each flow meter is dismantled independently.

CAUTION:	Be very careful when you start up the meter after maintenance: if the air enters the measuring chamber the rotor can easily reach high rotational speeds, leading to abnormal wear of the vanes and other components; this, in turn, will lead the meter to a major failure. See chap.3.2 for start-up precautions.

4.1 Disassembly

The flow meter may be considered as two main assemblies: the measuring chamber and the calibrating mechanism. To separate these two assemblies from each other, remove the screws securing the calibrating mechanism on the flow meter body.

CAUTION:	Before dismantling the meter for maintenance release pressure from the line and drain all the fluid inside the meter through the draining hole below the meter.

Proceed then with the maintenance of the faulty part.

4.1.1 Main components disassembling

- To ensure stability during the dismounting, it is advisable to use our "Ring Support tool" (see special tool).
- Remove the sealings and the screws of the counter, unscrew the screws fixing the calibrating mechanism and after the removal of the transmission spindle, take off the transmission spindle pin.
- Remove all nuts, bolts and washers of the front cover.
- Remove the front cover using the "Cover Removal Tool" (see special tool).
- Remove the rotor group by using the "Rotor removal and turning tool" (see special tool).Turn the rotor so that two graphite vanes re-enter in the rotor in correspondence of the smaller radius.

- Extract the rotor paying attention to use the free hand to guide the rotor and control the lateral vanes movement. Don't dismount the manifold unless there are product losses or breakings.

4.1.2 Rotor disassembling

NOTE: Never remove the vanes unless they are damaged. If it is necessary to remove the vanes, before proceeding mark the position of the four vanes that correspond with the position in the rotor: that will ease the reassambly procedure. Vanes are not interchangeable and, if they can be reused, they must be placed in their original position.

- Remove the split pin placed in the opposite side of the adjusting screws.
- Remove the vane and the two washers.
- Remove the remaining vane-rods assembly.

CAUTION: Don't remove or loosen the the vanes adjusting nuts, since that would vary the clearance between the vanes and the measuring chamber, causing loss of performance and/or meter failure.

4.2 Assembly

Before assembly, clean and inspect all parts for any visual damage. Ensure that all o-ring grooves are clean and undamaged. Examine the O-Rings and ensure that they are not damaged or swollen, replace them if necessary. Examine graphite bushes on rotor assembly for free rotation and play, replace them if either is apparent. Examine each vane assembly for damage or wear, replace vane(s) if either is apparent. Examine gland seal rings in rotor assembly for damage or wear and replace if either is apparent.

The assembly procedure is the reversal of the dismantling procedure; only for installation of the internal body special precautions should be taken to match the centering cap of the external body's front cover.

4.3 Storing

- if after a working period it is foreseen to stop the meter for a long time, drain the meter and its accessories;
- If the meter or the equipment of the system are not immediately used, or if it is withdrawn from service and stored, it is important to follow next instructions :
    - fill the meter and its accessories with clean kerosene or lubricated oil and close its ends with blind flanges;
    - fill the carter containing the calibrating mechanism with oil till the sight glass is reached (see chap.4.4).
- adequately protect counters against rain and dust, with damp-proof caps.

4.4 Calibrating mechanism (only for mechanical counter)

The calibrating mechanism comprises a train of gears which transmit movement of the rotor to the counter. Operational failures of the mechanism are rare and they generally regard the breaking of tension pin, due to an excessive strain.

It is recommended to repair without varying the calibrating adjustment.

CAUTION: do not remove the shimming washers between the frame and the bearing of the mechanism box.

4.4.1 Calibration of flow meter (see Fig.2)

To carry out meter calibration follow next procedures:

- Break and remove seals.
- Remove the three screws (1) securing the cover (2) to the housing (3) in which calibrating mechanism is fitted.
- Remove cover (2)
- By using square key (4 mm) turn shaft (4) till A, B, C holes placed on the bracket (5) and on friction roller (6) will be properly aligned.
- Insert in these holes the stop pin (supplied with the meter, then using the square key operate on the shaft (4) as follow :
    - turning counter-clockwise direction, even if the quantity of fluid does not vary, on the counter is obtained an higher volume indication;
    - turning clockwise direction it is obtained a lesser indication.

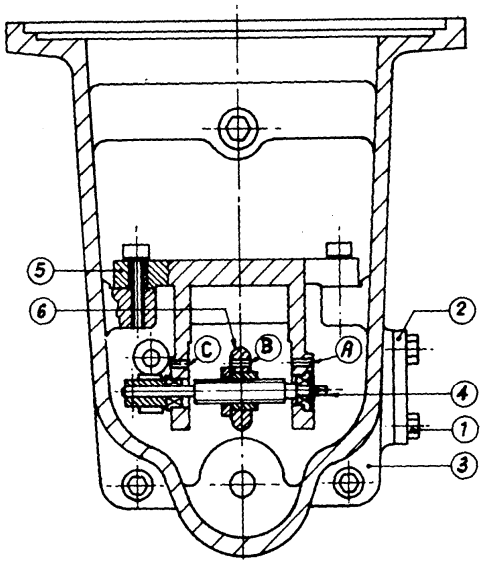


Fig. 2

NOTE: one complete turn of the screw varies the volume indicated on the meter by approximately 0,36% (per cent).

4.4.2 Suggested lubricating oils for calibrating mechanism

Company	Type	Temeprature range
AGIP	OTE 32 SINT 2000	-10÷+60 °C
ESSO	NUTO 32	-20÷+65 °C
IP	HINDRUS HI 46	-10÷+60 °C
SHELL	AEROSHELL FLUID 31	-40÷+204°C
MOBIL	DTE 26 MOBIL 1	-10÷+80 °C -10÷+200 °C

NOTE: to avoid ice forming in wintertime, add two spoons of car antifreeze.

4.5 Strainer/air separator

4.5.1 Strainer

A clean strainer is fundamental for the correct operation of the system; a dirt strainer would create an excessive pressure drop, leading to the failure of the basket and thus letting dirt, crusts and other harmful elements to flow into the fluid. If possible, check regularly the pressure drop between the inlet and the outlet of the strainer; the maximum allowed pressure drop is 130 kPa.

For a correct servicing of the basket, follow the procedure described below (dwg6474/1M):

- Discharge the pressure from the system and close the valves at the inlet and outlet
- Discharge the liquid inside the strainer air separator through the draining outlet on the bottom of the strainer
- Remove the cap
- Remove the basket and clean it thoroughly with a jet directed from inside to the outside; if possible, use a water cleaning machine
- Check accurately that the gasket is intact; if it is found to be damaged, replace with another one with the same filtering grade:

  For oils with viscosity up to 20°E(150cSt): 40 mesh (433 micron)

  For diesel oils: 60 mesh (247 micron)

  For gasoline or water: 100 mesh (153 micron)
- Put again the wire gauze in place, close the cover and the drain valve.

It's suggested to replace the gaskets between the strainer body and the cover each time the strainer air separator is disassembled.

4.5.2 Air vent valve

Follow the istructions below for the servicing of the air vent valve:

- Discharge the pressure from the system and close the valves at the inlet and outlet
- Discharge the liquid inside the strainer air separator through the draining outlet
- Inspect the air vent valve, checking that it works properly and its part aren't damaged
- Close the draining valve and restore the operating conditions

4.6 Tests after overhaul

After overhaul the p.d. meters must be tested with suitable proving systems. Error between the value stated by the p.d.meter counter and the value stated by the proving device is calculated as below:

Example:

Measured by the meter	Measured by the proving tank	Error (%)
1000 l	1003 l	-0,3%
1000 l	997 l	+0,3%

The formula is:

$$E\% = \frac{V - V_0}{V_0} \cdot 100$$

V= Measured by the meter

V_0= Measured by the proving tank

4.7 Extraordinary maintenance

The user must define a maintenance scheduling table according to the fluid utilised, the operational conditions, the estimated/real workloads and the environmental conditions.

For all extraordinary maintenance needed after a failure and/or the rising of a fault that compromises the normal operation of the system, please contact Isoil Impianti SpA Customer Care.

4.8 Spare parts

For a correct meter maintenance use only original spare parts from Isoil Impianti S.p.A. .

Isoil Impianti S.p.A. is not responsible for any problem that can result from the use of non original spare parts.

4.9 Maintenance schedule

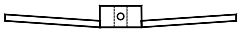
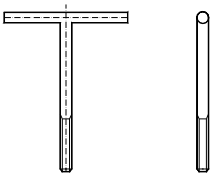
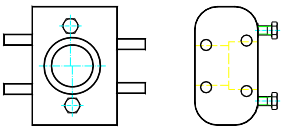
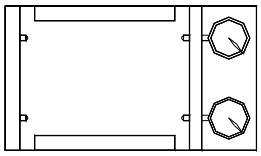
Task	Monthly	6 Months	12 Months	24 Months
Visual inspection of manifold and meter body; check for leaks	X			
Inspection of the meter; check for internal part status: vanes, rotor, measure chamber, o-rings; check for wear or damage.				X

4.10 Troubleshooting

Symptom	Possible cause	Remedy
Liquid passing with normal flow rate but counter fails to register.	1. Defective counter.	Remove and check the counter by rotating bottom coupling. In case of any problem in the counter, contact the factory.
	2. Drive from the rotor fails to reach the counter, due to sheared pins in the calibrating mechanism.	Check cross pins fitted on all gears in the calibrating mechanism.
No liquid passing through.	1. Defective counter.	Remove and inspect the counter for free movement.
	2. Jammed calibrating mechanism.	Remove and inspect the calibrating mechanism. Identify the source of friction and replace relevant parts.
	3. Jammed rotor assembly.	Dismantle meter assembly. Inspect front & rear covers and rotor for scoring marks. Inspect vanes and bearings for damage.
	Causes of rotor jamming :	
	a. Solid particles trapped on rotor surface.	Clean the rotor surfaces.

Symptom	Possible cause	Remedy
	b. Incorrect adjustment of rotor end clearance due to loose or defective bearing adjuster.	Check setting of bearing adjuster. Clean and inspect the bearing adjuster.
	c. Rotor bearings jammed.	Clean bearings and cover, and inspect for any damage.
	d. Rotor bearings worn out.	Replace the bearings, if axial play is observed.
	e. Misalignment of front & rear covers due to missing dowel pins.	Ensure that both dowel pins are used for locating the covers with the body.
	4. Clogged filter basket.	Clean the filter regularly.
Liquid is leaking from the joint at front cover and calibrating mechanism.	Spindle seal is damaged.	Replace the spindle seal. Inspect rotor spindle for wear or scratch marks.
Liquid is leaking from the joint at front cover and body or rear cover and body.	Damaged o'ring seals, unclean o'ring grooves, cover bolts loose.	Clean o'ring grooves, replace o'rings and secure cover bolts tightly.
Excess delivery beyond 1%.	1. Vane blades damaged.	Inspect and replace damaged vane blades.
	2. Jammed rotor or calibrating mechanism.	As described above.

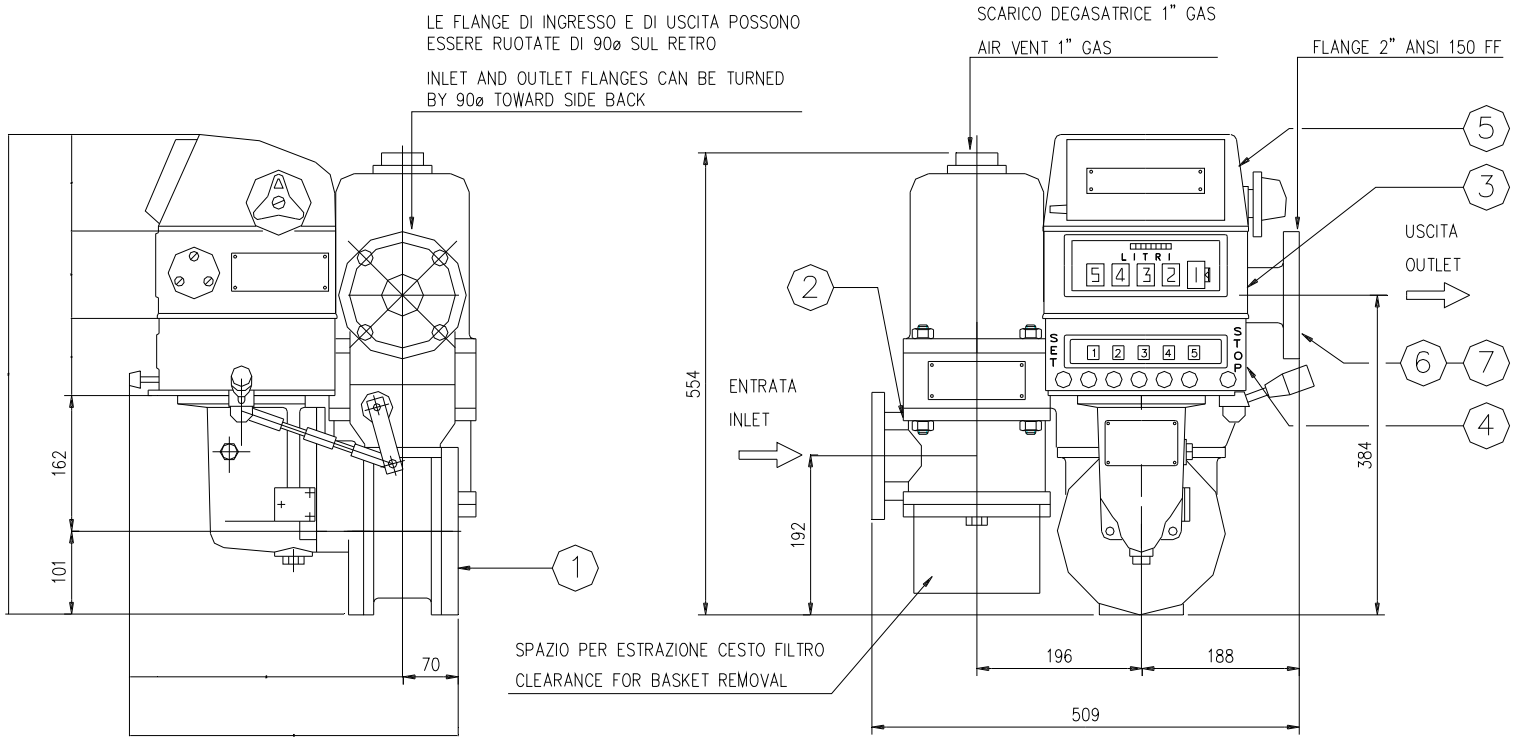
5 Special Tool

DESCRIPTION	*USE*	*FIGURE*
Rotor removal and turning tool Code 80AT0039	To fit on the rotor spindle in place of rotor gear when turning or removing rotor assembly	A 
Cover removal tool (n.2 pieces are necessary) Code 80AT0042	For extracting front cover.	B 
Bearings extractor Code 80ES0015	For dismounting the internal ring of the bearing after having broken the external ring.	C 
Vanes checking tool Code 80AT0063	For measuring of the vanes length.	D 

6 Technical data

- Maximum working pressure ..... 1000 kPa
- Working temperature..... -10°C ÷ +50°C
- Maximum flow rate ..... 500 lpm

The value reproduced in label can change as regards to those shown in the manual



1 CONTATORE	/	BULKMETER
2 NFILTRO DEGASATORE	/	COMBINED STRAINER AND AIR SEPARATOR
3 TESTATA INDICATRICE	/	COUNTER
4 PREDETERMINATORE	/	PRESET
5 STAMPATORE	/	TICKET PRINTER
6 VALVOLA A CHIUSURA LENTA	/	PRESET VALVE
7 VALVOLA CHECK	/	AIR-CHECK DEVICE

	DISEGNATO	CONTROLLATO	RIFERIMENTO DISEGNO	ORIGINE DISEGNO	QUOTE SENZA INDICAZIONE DI TOLLERANZA	SCALA
DATA	27-07-93	27-07-93	/	/	/	1:5
FIRMA						

ISOIL

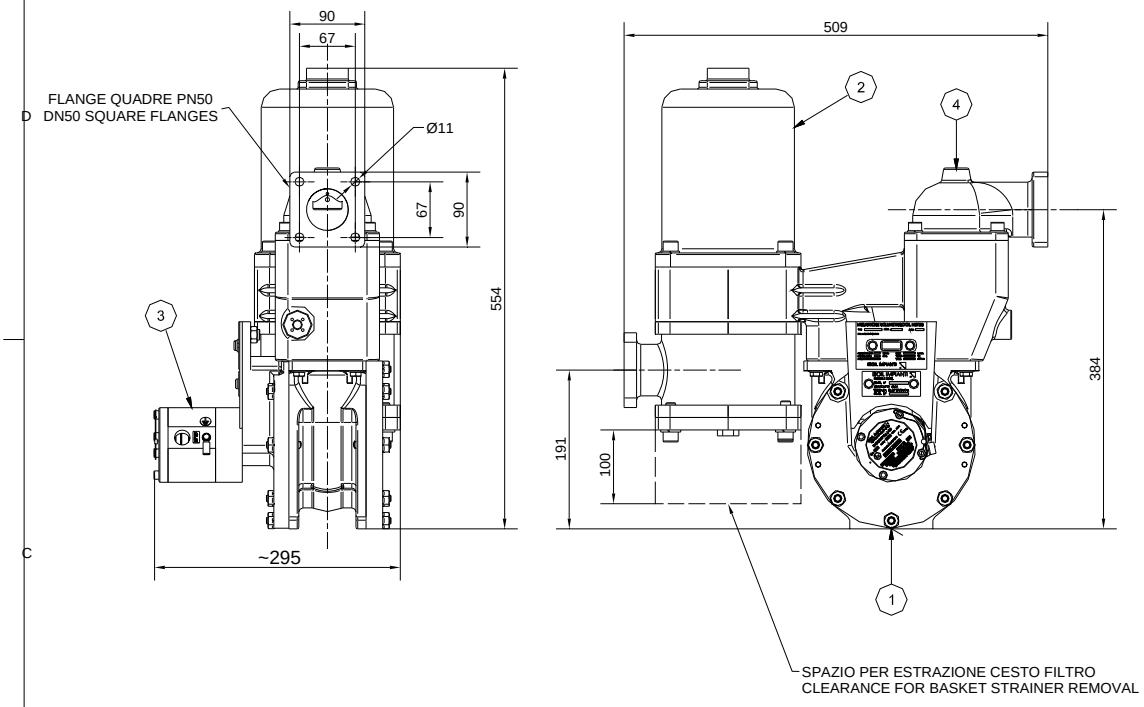
Albano Sant'Alessandro (Bergamo)
Cinisello Balsamo (Milano) - ITALY

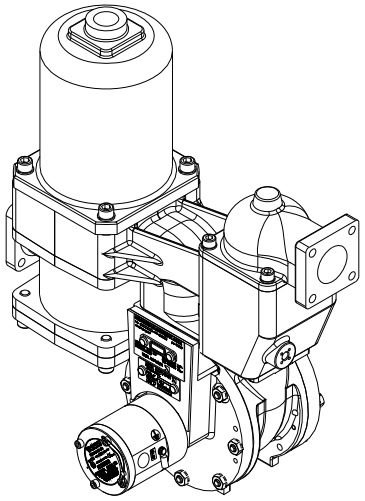
DESCRIZIONE:
DISEGNO DIMENSIONALE PER PROSPETTO CONTATORI "SBM75"

INDICE MODIFICHE: A F B G C H D I E L

DIS. NG 4251

FOGLIO NG 1 DI 1





POS.	DENOMINAZIONE	ITEM
1	CONTATORE	P.D.METER
2	FILTRO DEGASATORE	STRAINER AIR SEPARATOR
3	EMETTITORE EM 6422	ENCODER EM 6422
4	VALVOLA CHECK	CHECK VALVE

Tolleranze lineari ISO 2768-m	Peso	Materiale	Trattamento	Rugosità
Tolleranze smussi e raccordi ISO 2768-m	/	/	/	
Tolleranze gradi ISO 2768-m				

Origine disegno /
Riferimento disegno /
Codice /

Descrizione:
MISURATORE SBM75 AL CF+CHECK
SBM75 METER CF+CHECK

Emesso FZ/GF	Data 11/06/07	
Disegnato ZANGHI'	Data 11/06/07	
Controllato FONTANA	Data 11/06/07	

ISOIL IMPIANTI
Albano Sant'Alessandro (Bg) ITALY

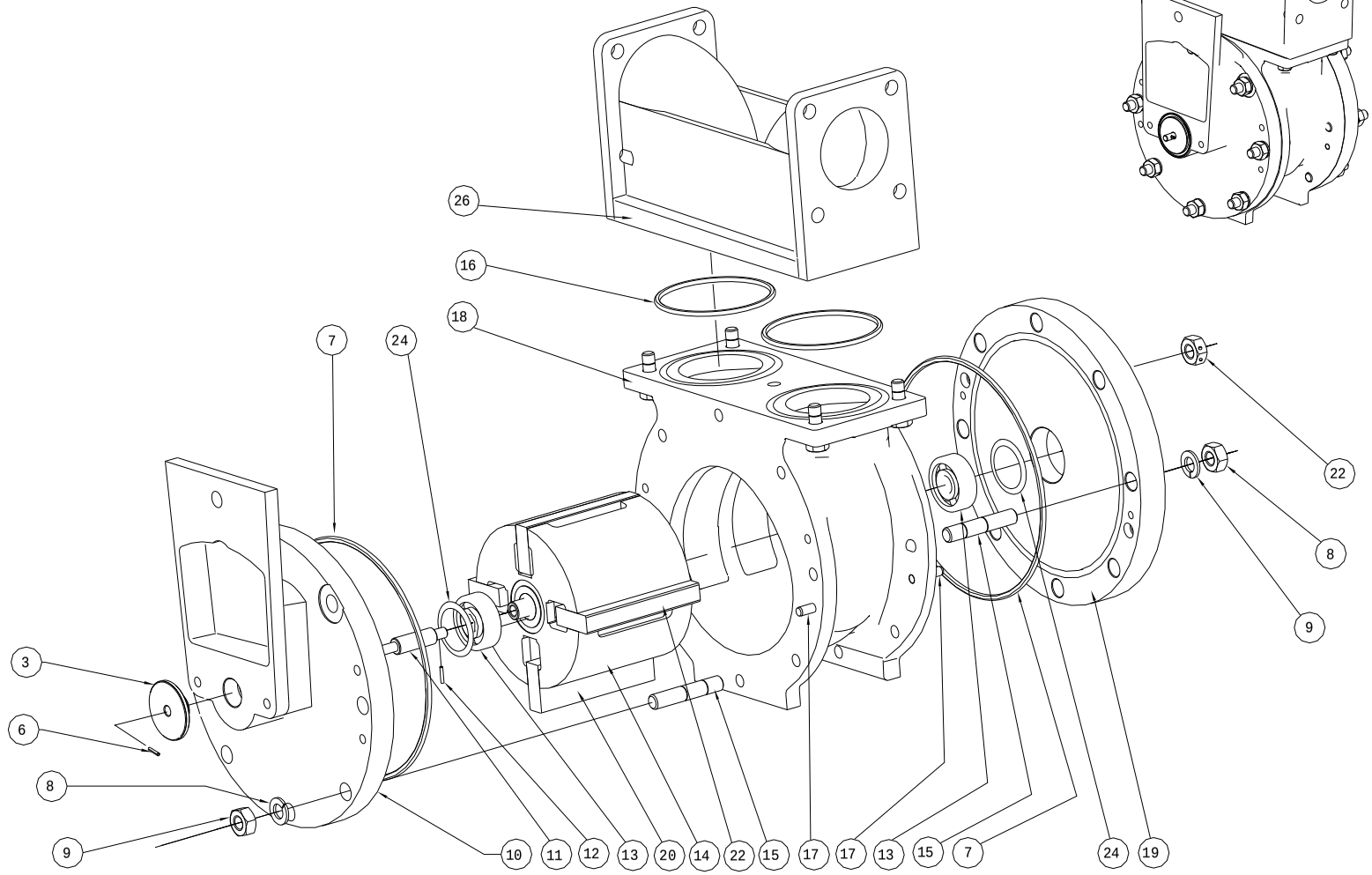
Disegno n° 5302-3
Indice revisioni: A B C D E F G H I L
Formato originale: A3
Scala: 1:5
Foglio: 1 di 1
Le quote, dove non diversamente indicato, sono espresse in mm.

ASSIEME CONTATORE VOLUMETRICO SBM75

SBM75 P.D.METER ASSEMBLY

DIS.6474- M

FOGLIO1 DI 1



ISOIL IMPIANTI	ASSIEME CONTATORE SBM75	Dis. 6474-M
	SBM75 P.D. METER ASSEMBLY	Foglio 1 di 1

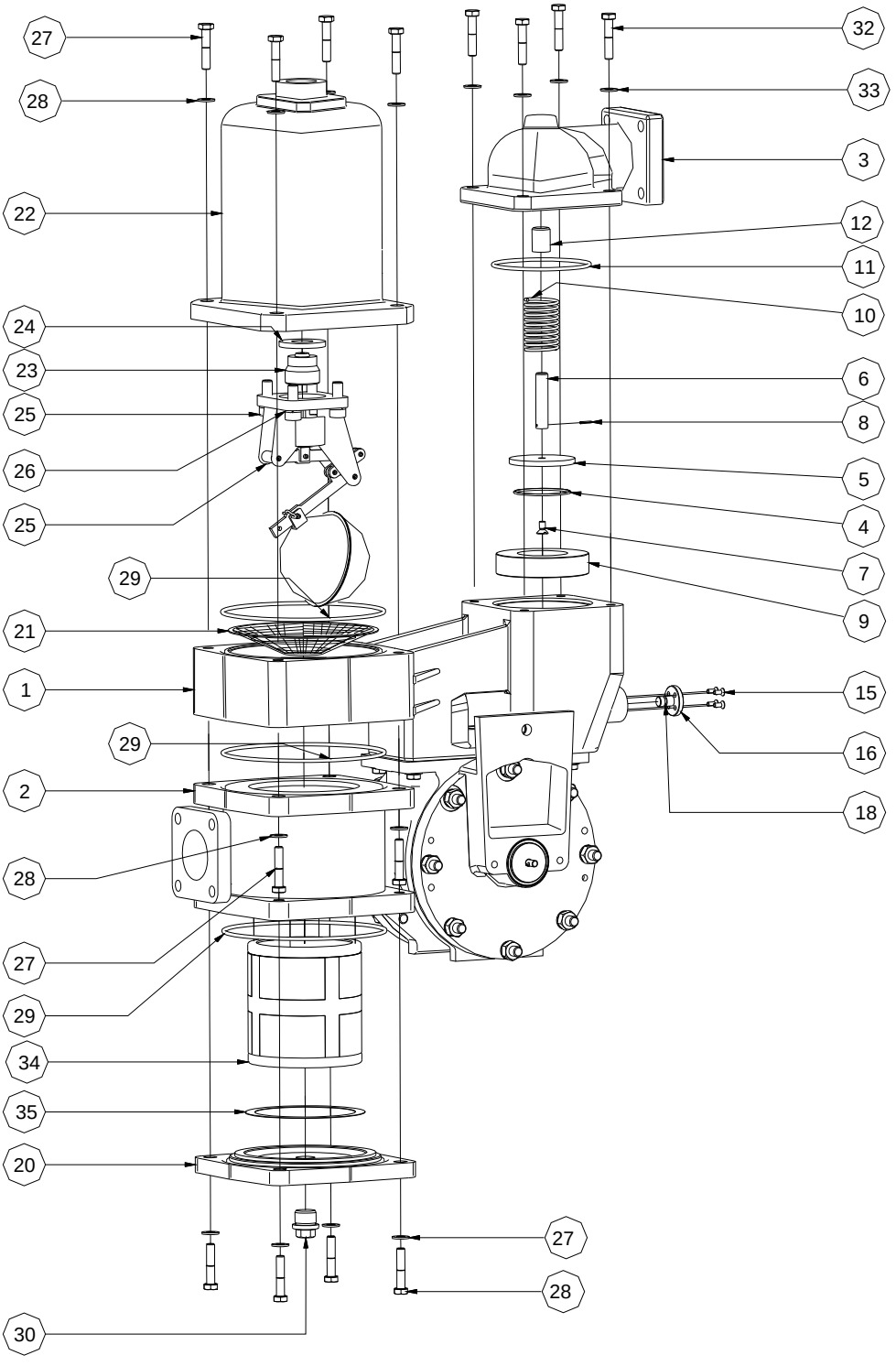
pos. / *item*	CODICE / *CODE*	DESCRIZIONE / *DESCRIPTION*	Q.tà / *Q.ty*	MATERIALE / *MATERIAL*	pos. / *item*	CODICE / *CODE*	DESCRIZIONE / *DESCRIPTION*	Q.tà / *Q.ty*	MATERIALE / *MATERIAL*
3	-	BM 36/1 *BM 36/1*	-		18	80COG045	Corpo *Body*	1	Alluminio *Aluminium*
6	80SP5009	Spina spirale *Spirol pin*	1	Acc. carbonio *Carbon steel*	19	80COB363	Coperchio post. *Back cover*	1	Acc. carbonio *Carbon steel*
7*	80GU1582	Guarnizione OR *O-Ring*	2	Nitrile *Nitrile*	20*	80COC040	Coppia pattini DX *RH Vanes pair*	1	-Rilsan *-Rilsan*
7*	80GU1579	Guarnizione OR *O-Ring*	2	FKM *FKM*	22*	80COC070	Coppia pattini SX *LH vanes pair*	1	-Rilsan *-Rilsan*
8	80RO1180	Rondella elastica *Spring washer*	16	Acc. carbonio *Carbon steel*	24	-	Spessore Shim	1	- -
9	80DA1018	Dado *Nut*	12	Acc. carbonio *Carbon steel*	26	80CO0123	Collettore *Manifold*	1	Alluminio *Aluminium*
10	80COB123	Coperchio ant. *Front cover*	1	Alluminio *Aluminium*	27	80VI2129	Vite *Screw*	4	Acc. carbonio *Carbon steel*
11	80AL0323	Alberino *Shaft*	1	Acc. carbonio *Carbon steel*					
12	80SP5006	Spina spirale *Spirol pin*	1	Acc. carbonio *Carbon steel*					
13*	80CU1102	Cuscinetto *Bearing*	2	Acc. inox *St. steel*					
14	80RO2060	Rotore *Rotor*	1	Alluminio *Aluminium*					
15	80PR3018	Prigioniero *Stud*	16	Acc. carbonio *Carbon steel*					
16*	80GU1135	Guarnizione OR *O-Ring*	2	FKM *FKM*					
16*	80GU1138	Guarnizione OR *O-Ring*	2	Nitrile *Nitrile*					
17	80SP6018	Spina cilindrica *Pin*	4	Acc. carbonio *Carbon steel*					

(*) Parti di ricambio consigliate
Suggested spare parts

ASSIEME CONTATORE VOLUMETRICO SBM75
ASSEMBLY SBM75 P.D. METER

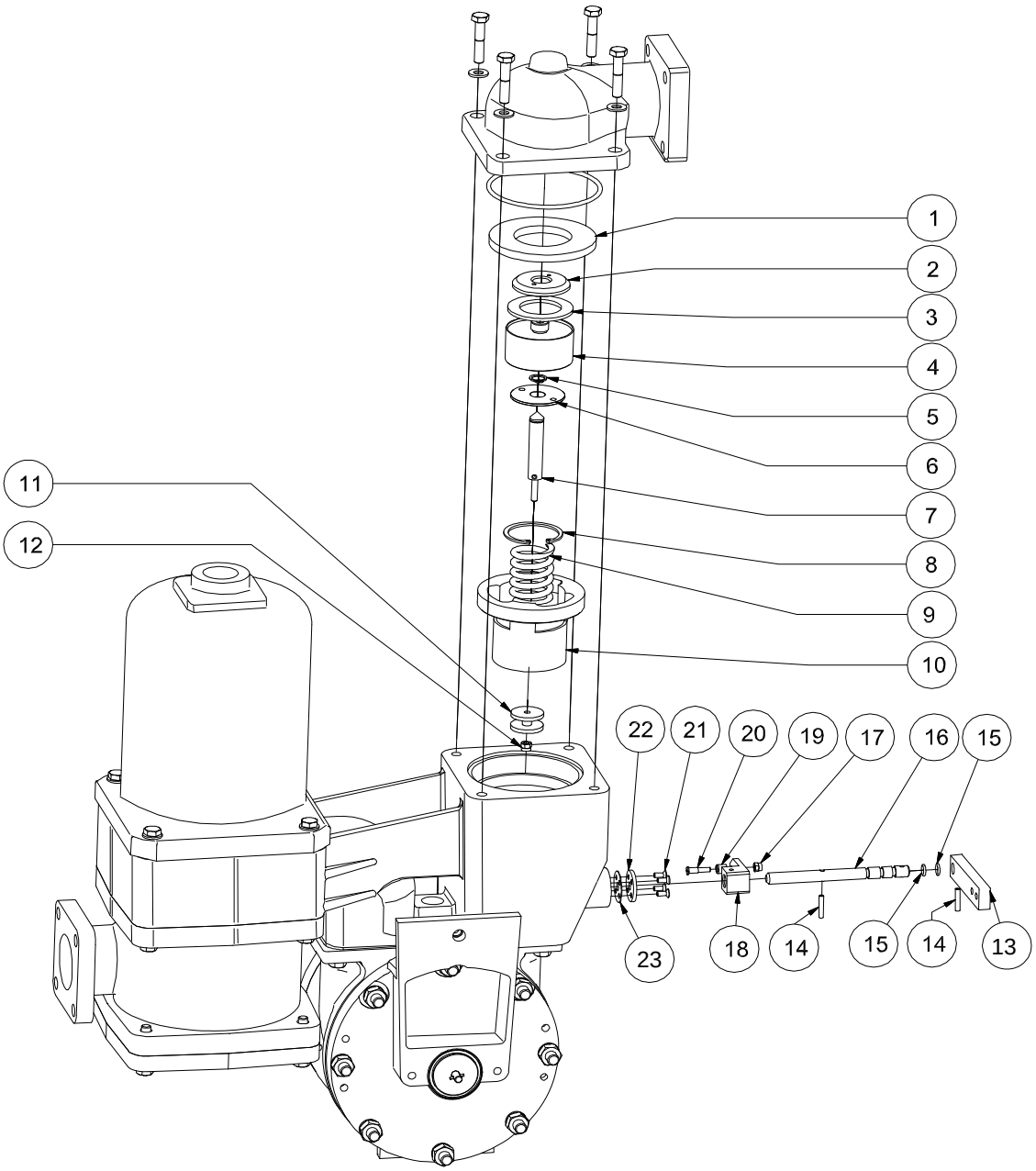
DIS.6474/1M

REV. A



ISOIL IMPIANTI	ASSIEME CONTATORE SBM 75 *SBM75 P.D. METER ASSEMBLY*							Dis. 6474-1M Foglio 1 di 1	
pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*	pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*
1	**80COG009**	Corpo collettore *Body*	1	Alluminio *Aluminium*	24*	**80GU0172**	Guarnizione OR *O-ring*	1	Nitrile *Nitrile*
2	**80COG219**	Corpo filtro *Strainer body*	1	Alluminio *Aluminium*	24*	**80GU0171**	Guarnizione OR *O-ring*	1	FKM *FKM*
3	**80GO1009**	Gomito *Elbow*	1	Alluminio *Alluminium*	25	**80VI4201**	Vite *Srew*	4	Acc. Carbonio *Carbon steel*
4*	**80GU1360**	Guarnizione OR *O-ring*	1	Nitrile *Nitrile*	26	**80RO1207**	Rondella elastica *Spring washer*	4	Acc. Carbonio *Carbon steel*
4*	**80GU1357**	Guarnizione OR *O-ring*	1	FKM *FKM*	27	**80VI2192**	Vite *Srew*	12	Acc. Carbonio *Carbon steel*
5	**80PI1003**	Piattello *Plate*	1	Acc. Carbonio *Carbon steel*	28	**80RO1183**	Rondella elastica *Spring washer*	12	Acc. Carbonio *Carbon steel*
6	**80AL0153**	Alberino *Shaft*	1	Acc. Inox *St. steel*	29*	**80GU1582**	Guarnizione OR *O-ring*	3	Nitrile *Nitrile*
7	**80VI8111**	Vite *Srew*	1	Acc. Carbonio *Carbon steel*	29*	**80GU1579**	Guarnizione OR *O-ring*	3	FKM *FKM*
8	**80SP5009**	Spina spirale *Spirol spin*	1	Acc. al carb. *Carbon steel*	30	**80TA1090**	Tappo *Pulg*	1	Acc. Inox *St. steel*
9	**80AN1018**	Anello *Ring*	1	Alluminio *Aluminium*	31	**80VA4021**	Valvola Degasatrice *Air vent valve*	1	- -
10	**80MO0129**	Molla *Spring*	1	Acc. Inox *St. steel*	32	**80VI4267**	Vite *Srew*	4	Acc. Carbonio *Carbon steel*
11*	**80GU1501**	Guarnizione OR *O-ring*	1	Nitrile *Nitrile*	33	**80RO1180**	Rondella *Washer*	4	Acc. Carbonio *Carbon steel*
11*	**80GU1498**	Guarnizione OR *O-ring*	1	FKM *FKM*	34*	**80CE2075**	Cesto filtro 100mesh *Strain. basket 100mesh*	1	Acc. Inox *St. steel*
12	**80BO1039**	Boccola *O-ring*	1	Ottone *Brass*	34*	**80CE2069**	Cesto filtro 60 mesh *Strain. basket 60mesh*	1	Acc. Inox *St. steel*
15	**80VI8051**	Vite *Srew*	4	Acc. Carbonio *Carbon steel*	34*	**80CE2066**	Cesto filtro 40 mesh *Strain. basket 40 mesh*	1	Acc. Inox *St. steel*
16	**80PI1045**	Piattello *Plate*	1	Ottone *Brass*	35	**80GU0024**	Guarnizione *Gasket*	1	Nitrile *Nitrile*
18*	**80GU1195**	Guarnizione OR *O-ring*	1	Nitrile *Nitrile*					
18*	**80GU1192**	Guarnizione OR *O-ring*	1	FKM *FKM*					
20	**80COB297**	Coperchio filtro *Strainer cover*	1	Alluminio *Aluminium*					
21	**80DI0000**	Diaframma *Diaphragm*	1	Acc. al carb. *Carbon steel*					
22	**80CA0006**	Calotta *Cap*	1	Alluminio *Aluminium*					
23	**80PI7012**	Pistone *Piston*	1	Bronzo *Bronze*	*	**Parti di ricambio consigliate / Suggested spare parts**			
									T-3291-2.XLS

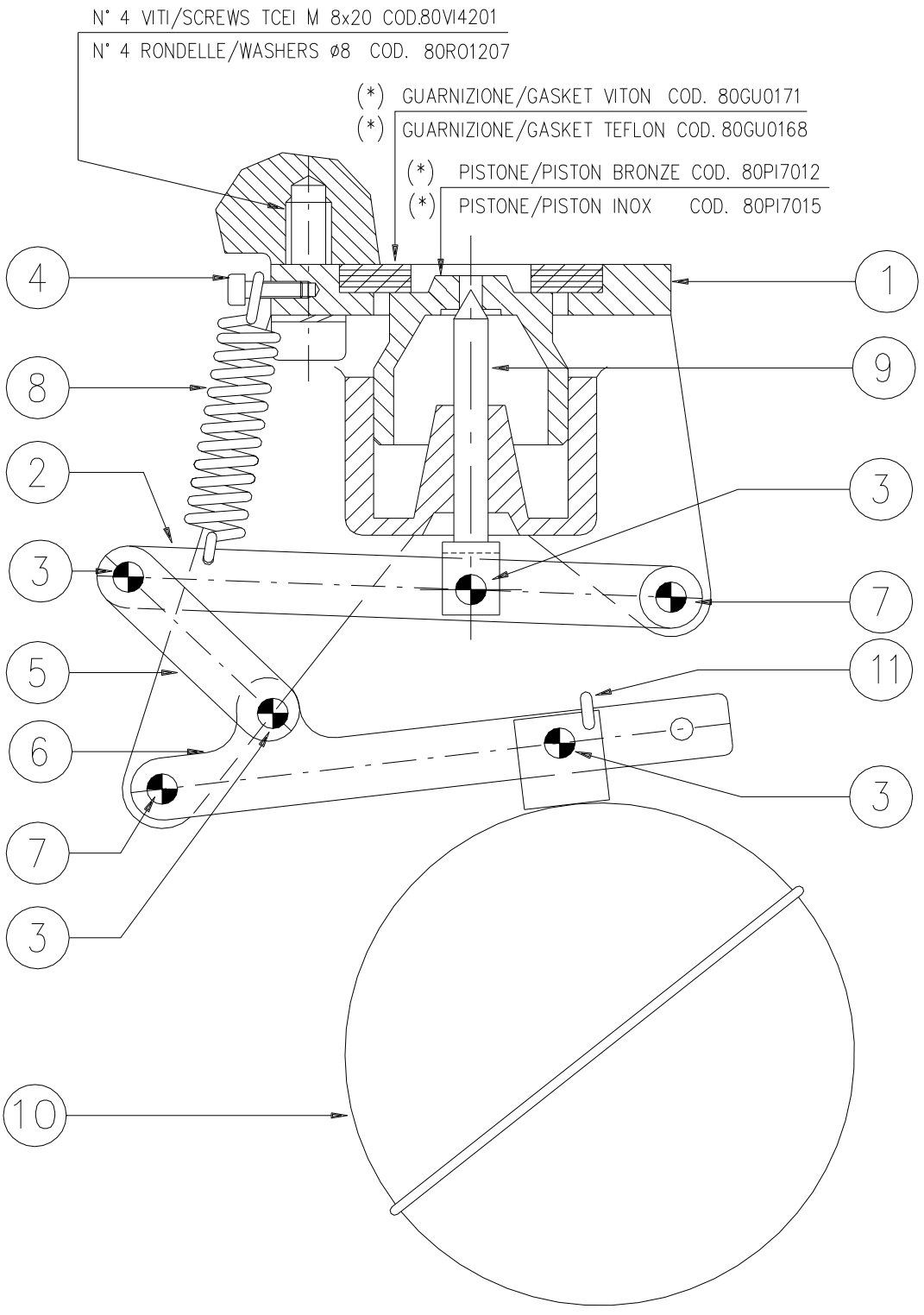
ISOIL	ASSIEME VALVOLA PRESET PER SBM75 PRESET VALVE ASSEMBLY FOR SBM75	DIS. 6474-2M REV A



ISOIL IMPIANTI	ASSIEME VALVOLA PRESET SBM75 *PRESET VALVE ASSEMBLY FOR SBM75*								Dis. 6474-2M Foglio 1 di 1
pos. ***item***	**N° CODICE** ***N° CODE***	**DESCRIZIONE** ***DESCRIPTION***	**Q.tà** ***Q.ty***	**MATERIALE** ***MATERIAL***	pos. *item*	**N° CODICE** ***N° CODE***	**DESCRIZIONE** ***DESCRIPTION***	**Q.tà** ***Q.ty***	**MATERIALE** ***MATERIAL***
1	**80PI1015**	Piattello tenuta *Plate*	1	Acc. Carbonio *Carbon steel*	21	**80VI8051**	Vite *Srew*	4	Acc. Carbonio *Carbon steel*
2	**80GH0015**	Ghiera *Metal ring*	1	Bronzo *Brass*	22	**80PI1045**	Piattello *Plate*	1	Ottone *Brass*
3*	**80GU0443**	Guarnizione *Gasket*	1	Nitrile *Nitrile*	23	**80SP0162**	Vite *Srew*	1	Ottone *Brass*
3*	**80GU0444**	Guarnizione *Gasket*	1	FKM *FKM*					
4	**80PI7006**	Pistone *Piston*	1	Bronzo *Brass*					
5	**80AN2039**	Anello elastico *Circlip*	1	Acc. Carbonio *Carbon steel*					
6	**80PI1021**	Piattello *Plate*	1	Acc. Carbonio *Carbon steel*					
7	**80PI6000**	Pilota *Pilot*	1	Acc. Inox *St. steel*					
8	**80AN3048**	Anello elastico *Circlip*	1	Acc. Carbonio *Carbon steel*					
9	**80MO0132**	Molla *Spring*	1	Acc. Inox *St. steel*					
10	**80CA1063**	Camera valvola *Valve chamber*	1	Acc. Carbonio *Carbon steel*					
11	**80AG0000**	Aggancio di comando Driver	1	Acc. Carbonio *Carbon steel*					
12	**80DA3042**	Dado *Nut*	1	Acc. Carbonio *Carbon steel*					
13	**80LE0027**	Leva *Lever*	1	Acc. Carbonio *Carbon steel*					
14	**80SP5078**	Spina *Pin*	2	Acc. Carbonio *Carbon steel*					
15*	**80GU1195**	Guarnizione OR *O-ring*	2	Nitrile *Nitrile*					
15*	**80GU1192**	Guarnizione OR *O-ring*	2	FKM *FKM*					
16	**80AL0156**	Alberino *Shaft*	1	Acc. Inox *St. steel*					
17	**80DA3015**	Dado *Nut*	1	Acc. Carbonio *Carbon steel*					
18	**80LE0009**	Leva *Lever*	1	Acc. Carbonio *Carbon steel*					
19	**80BO1015**	Boccola *Bush*	1	- -					
20	**80PE1003**	Perno *Shaft*	1	Acc. Carbonio *Carbon steel*	*** Parti di ricambio consigliate / Suggested spare parts**				

T-3291-2.XLS

ISOIL	VALVOLA DEGASATRICE AIR VENT VALVE	DIS. 565–M FOGLIO 1 DI 2



ASSIEME VALVOLA DEGASATRICE DIS. 565 GALLEGGIANTE ø90 VALVE ASSEMBLY FLOAT ø90	COD. 80VA4021
ASSIEME VALVOLA DEGASATRICE DIS. 565 GALLEGGIANTE ø110 VALVE ASSEMBLY FLOAT ø110	COD. 80VA4024

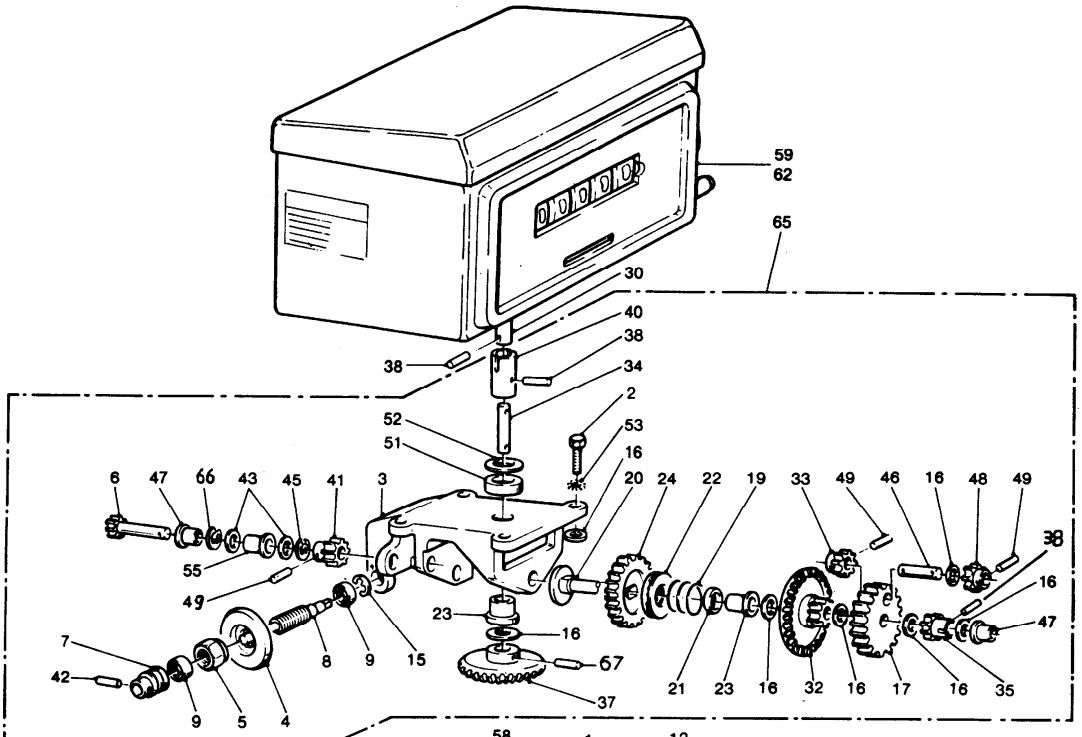
* PARTI DI RICAMBIO CONSIGLIATE /SUGGESTED SPARE PARTS

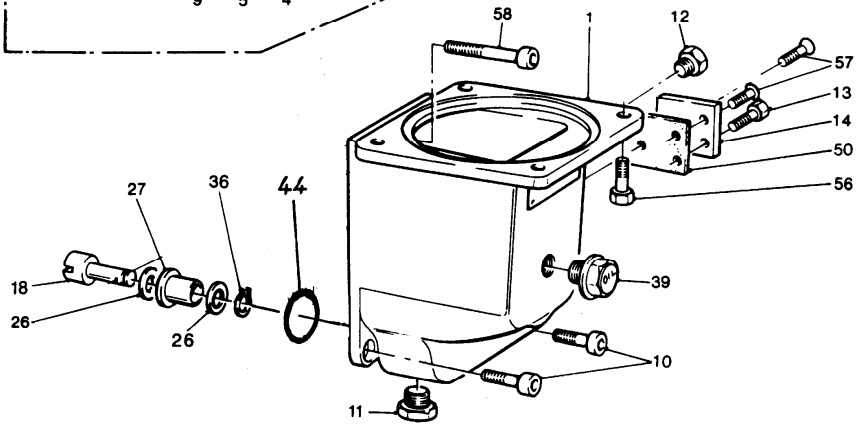
ISOIL IMPIANTI	VALVOLA DEGASATRICE *AIR VENT VALVE*	Dis. 565-M Foglio 2 di 2

pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*	pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*
1	**80COG018**	Corpo *Body*	1	Alluminio *Aluminium*					
2	**80LE0054**	Leva pilota *Pilot lever*	1	Alluminio *Aluminium*					
3	**80PE1081**	Perno *Pin*	4	Acciaio inox *St.steel*					
4	**80VI4006**	Vite TCEI 3x10 *Screw TCEI 3x10*	1	Acciaio inox *St.steel*					
5	**80LE0000**	Leva collegamento *Connection lever*	1	Alluminio *Aluminium*					
6	**80LE0030**	Leva galleggiante *Floating lever*	1	Alluminio *Aluminium*					
7	**80PE1078**	Perno lungo *Long pin*	2	Acciaio inox *St.steel*					
8	**80MO0084**	Molla *Spring*	1	Acciaio inox *St.steel*					
9*	**80SP4006**	Spillo pilota *Pilot pin*	1	Acciaio inox *St.steel*					
10*	**80SF0015**	Sfera gall.ø 90 *Floating sphere ø 90*	1	Acciaio inox *St.steel*					
10*	**80SF0018**	Sfera gall.ø 110 *Floating sphere ø 110*	1	Acciaio inox *St.steel*					
11	**80COD0006**	Coppiglia a molla *Coter pin*	1	Acciaio inox *St.steel*					
					* **Parti di ricambio consigliate / *Suggested spare parts***				

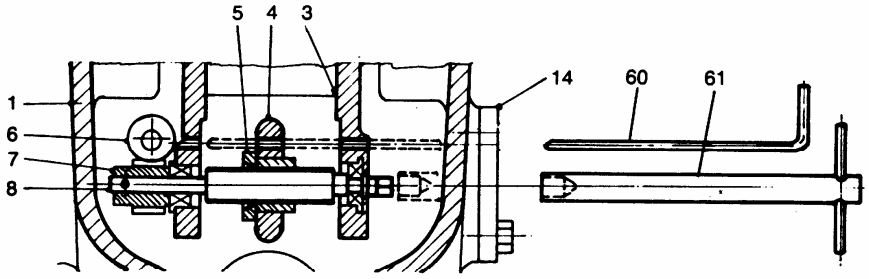
T-565-M.XLS

ISOIL	MECCANISMO DI CALIBRAZIONE SBM 75 MK2 E SBM 75 ALL. *CALIBRATING MECHANISM SBM 75 MK2 AND SBM 75 ALUMINIUM*	DISEGNO *DRAWING* N. 672/75





INTRODUZIONE CHIAVI PER
TARATURA CONTATORE
USE OF KEYS FOR
METER' S CALIBRATION



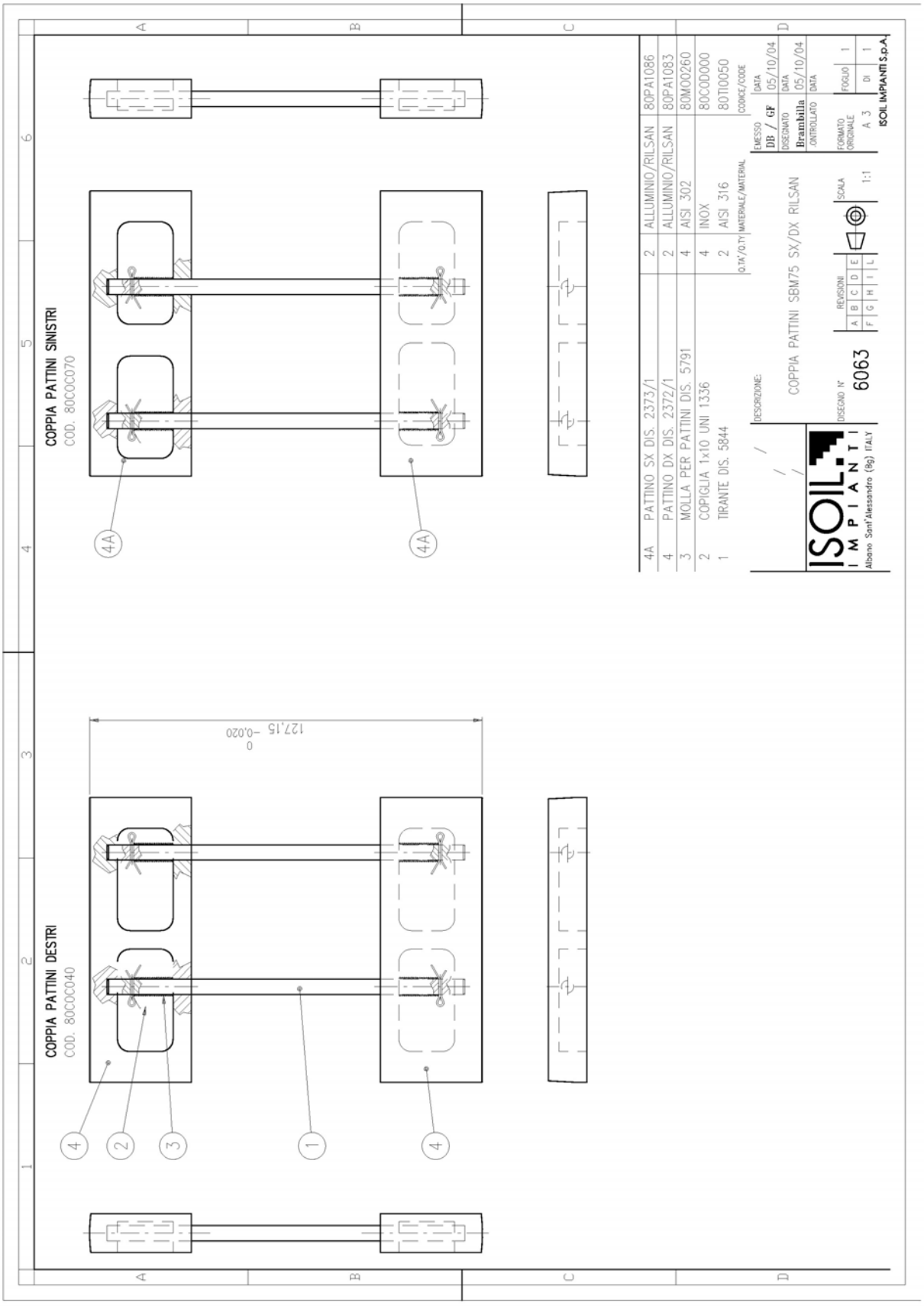
T-672-75.DOC

ISOIL IMPIANTI	MECCANISMO DI CALIBRAZIONE SBM 75 MK2 E SBM 75/AL *CALIBRATION MECHANISM SBM 75 MK2 AND SBM 75/AL*	Dis. 672/75 Foglio 1 di 2

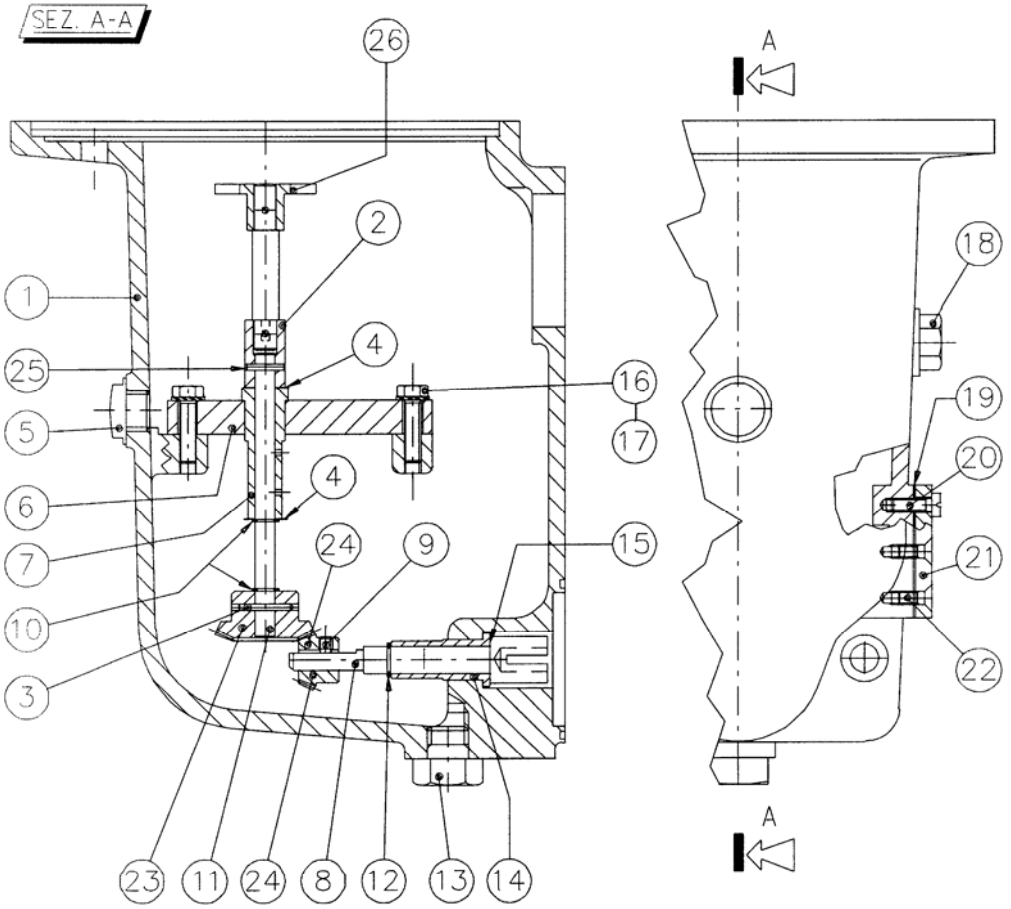
pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*	pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*
1	**80SC2009**	Scatola meccanismo *Calibr.mechanism box*	1	Alluminio *Aluminium*	24	**80IN3144**	Ingranaggio *Gear*	1	Acc.al carb. *Carbon Steel*
2	**80VI2042**	Vite fissaggio supporto *Support screw*	4	Acc.al carb. *Carbon Steel*	26	**80RO1075**	Rondella di rasamento *Shim washer*	2	Acc.al carb. *Carbon Steel*
3	**80SV0012**	Supporto disp.regolaz. *Calibr.mech.support*	1	Alluminio *Aluminium*	27	**80BO1009**	Boccola autolubrif. *Self-lubric. bush*	1	Bronzo *Bronze*
4	**80AS0027**	Ass.disco frizione *Friction wheel*	1	Acc.al carb. *Carbon Steel*	28*	**80SP5009**	Spina spirale *Spirol pin*	1	Acc.al carb. *Carbon Steel*
5		Fornito con pos.4 *Supplied with item 4*			30	**80AL0270**	Alberino prolunga *Extension shaft*	1	Acc.al carb. *Carbon Steel*
6*	**80AS0129**	Ass.albero con pign. *Shaft with pinion*	1	Acc.al carb. *Carbon Steel*	32	**80PI5000**	Pignone conico *Bevel pinion*	1	Acc.al carb. *Carbon Steel*
7	**80AS0258**	Ass. vite senza fine *Worm screw*	1	Acc.al carb. *Carbon Steel*	33		Viene forn. con pos.17 *Supplied with item 17*		
8*		Fornito con pos.7 *Supplied with item 7*	1		34	**80AS0084**	Ass. alberino/pignone *Shaft/gear assembly*	1	Acciaio inox *St. steel*
9*	**80CU1081**	Cuscinetti *Bearings*	2	Acciaio inox *Stainless steel*	35	**80IN3162**	Ingranaggio *Gear*	1	Acc.al carb. *Carbon Steel*
10	**80VI4201**	Viti *Screws*	2	Acc.al carb. *Carbon Steel*	36	**80AN2024**	Anello elastico *Elastic ring*	1	Acc.al carb. *Carbon Steel*
11	**80TA1072**	Tappo scarico *Oil discharge plug*	1		37		Fornito con pos.34 *Supplied with item 34*	1	
12	**80TA1015**	Tappo carico olio *Oil charge plug*	1		38	**80SP5009**	Spina spirale *Spirol pin*	3	Acc.al carb. *Carbon Steel*
13	**80VI5117**	Vite *Screw*	1	Acc.al carb. *Carbon Steel*	39	**80IN0006**	Indicatore livello olio *Oil level indicator*	1	
14	**80COB069**	Coperchio accesso *Calibrating cap*	1	Alluminio *Aluminium*	40	**80MA1012**	Manicotto per trasmis. *Transmission sleeve*	1	Acc.al carb. *Carbon Steel*
15	**80AN2018**	Anello elastico *Bearing circlip stop*	1	Acc.al carb. *Carbon Steel*	41		Fornito con pos.6 *Supplied with item 6*	1	
16	**80RO1063**	Rondella rasamento *Shim washer*	7	Acc.al carb. *Carbon Steel*	42	**80SP5006**	Spina spirale *Spirol pin*	1	Acc.al carb. *Carbon Steel*
17	**80AS0123**	Assieme ingranaggi *Gears assembly*	1	Acc.al carb. *Carbon Steel*	43	**80RO1078**	Rondella di rasamento *Shim wahser*	2	Acc.al carb. *Carbon Steel*
18	**80AL0132**	Alberino *Gear pin*	1	Acc.al carb. *Carbon Steel*	44*	**80GU1243**	Guarnizione *Gasket*	1	Viton *Viton*
19	**80MO0228**	Molla spingi disco friz. *Friction plate spring*	1	Acciaio inox *St. steel*	45	**80AN2006**	Anello elastico *Circlip*	1	Acc.al carb. *Carbon Steel*
20	**80PI1057**	Piattello per frizione *Friction plate*	1	Acc.al carb. *Carbon Steel*	46		Fornito con pos.17 *Supplied with item 17*		
21	**80RO1042**	Rondella di centraggio *Centering washer*	1	Acc.al carb. *Carbon Steel*	47	**80BO1000**	Boccola *Bush*	2	Bronzo *Bronze*
22*	**80CU1045**	Cuscinetto reggispinta *Axial bearing*	1	Acc.al carb. *Carbon Steel*	48		Fornito con pos.17 *Supplied with item 17*		
23	**80BO1000**	Boccola *Bush*	2	Bronzo *Bronze*	*** Parti di ricambio consigliate / Suggested spare parts**				

ISOIL IMPIANTI	MECCANISMO DI CALIBRAZIONE SBM 75 MK2 E SBM 75/AL *CALIBRATION MECHANISM SBM 75 MK2 AND SBM 75/AL*	Dis. 672/75 Foglio 2 di 2

pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*	pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*
49	**80SP5006**	Spina spirale *Spirol pin*	3	Acc.al carb. *Carbon steel*					
50*	**80GU0207**	Guarnizione *Gasket*	1	Gomma antiolio *Rubber*					
51	**80DI6018**	Distanziale *Spacer*	1	Ottone *Brass*					
52	**80RO1081**	Rondella di rasamento *Shim washer*	1	Acc.al carb. *Carbon steel*					
53	**80RO1033**	Rondella *Washer*	4	Acc.al carb. *Carbon steel*					
54	**80RO1093**	Rondella *Washer*	1	Bronzo *Bronze*					
55	**80BO1000**	Boccola *Bush*	1	Bronzo *Bronze*					
56	**80VI9009**	Vite *Screw*	4	Acciaio *Carbon steel*					
57	**80VI8048**	Vite *Screw*	2	Acciaio *Carbon steel*					
58	**80VI4312**	Vite *Screw*	1	Acc.al carb. *Carbon steel*					
59	**81TE0003**	Testata VR 7887 *Counter VR 7887*	1						
60	**80COC003**	Coppia chiavi taratura *Calibrat. keys*	1						
61		Fornito con pos.60 *Supplied with item 60*							
62	**81PI1006**	Piattello destro (litri) *Right plate (litres)*	1						
62	**81PI1003**	Piattello sinistro (litri) *Left plate (litres)*	1						
65	**80DI5021**	Dispositivo calibraz. *Calibration mechanism*	1						
66	**80AN2009**	Anello elastico *Circlip*	1	Acc.al carb. *Carbon steel*					
					*** Parti di ricambio consigliate / Suggested spare parts**				



ISOIL	SCATOLA DI TRASMISSIONE PER MONTAGGIO TESTATA VEGA (CON PROLUNGA O EMETTITORE) *GEARING BOX FOR MOUNTING OF ELECTRONIC COUNTER VEGA (WITH EXTENSION OR PULSE EMITTER)*	DISEGNO *DRAWING* N. 3958



T-3958.DOC

ISOIL IMPIANTI	SCATOLA DI TRASMISSIONE PER MONT.TESTATA VEGA	Dis. 3958
	GEARING BOX FOR ELECTR. COUNTER VEGA MOUNTING	Foglio 1 di 1

pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*	pos. *item*	N° CODICE *N° CODE*	DESCRIZIONE *DESCRIPTION*	Q.tà *Q.ty*	MATERIALE *MATERIAL*
1	**80SC2030**	Scatola meccanismo *Mechanism box*	1	Alluminio *Aluminium*	24	**80IN3276**	Ingranaggio *Gear*	1	Acc.carbonio *Carbon steel*
2	**80MA1009**	Manicotto di trasmissione *Transmission coupling*	1	Acc.carbonio *Carbon steel*	25	**80SP5009**	Spina spirale *Spirol pin*	1	Acc.carbonio *Carbon steel*
3	**80SP5018**	Spina spirale *Spirol pin*	1	Acc.carbonio *Carbon steel*	26	**80AS0102**	Trascinatore *Entrainer*	1	Acc.carbonio *Carbon steel*
4	**80RO1078**	Rondella di rasamento *Washer*	4	Acc.carbonio *Carbon steel*					
5	**80IN0006**	Indicatore livello olio *Oil level indicator*	1						
6	**80SU0072**	Supporto mecc.perVEGA Mech.support for	1	Alluminio *Aluminium*					
7	**80BO1147**	Boccola *Bush*	1	Bronzo *Bronze*					
8	**80AL0243**	Alberino *Shaft*	1	Acc.inox *St.steel*					
9	**80GR1093**	Grano *Grain*	1	Acc.inox *St.steel*					
10	**80AN2006**	Anello elastico *Retaining ring*	2	Acc. al carb. *Carbon steel*					
11	**80AL0246**	Alberino *Shaft*	1	Acc. inox *St. steel*					
12	**80AN2000**	Anello elastico *Retaining ring*	1	Acc. al carb. *Carbon steel*					
13	**80TA1072**	Tappo scarico olio+guarn. *Oil discharge plug*	1						
14	**80BO1099**	Boccola *Bush*	1	Bronzo *Bronze*					
15	**80RO1066**	Rondella di rasamento *Washer*	2	Acc. al carb. *Carbon steel*					
16	**80VI2042**	Vite *Screw*	4	Acc. al carb. *Carbon steel*					
17	**80RO1033**	Rondella dent.esterna *Exernal washer*	4	Acc. al carb. *Carbon steel*					
18	**80TA1015**	Tappo carico olio *Oil charge plug*	1						
19	**80GU0207**	Guarnizione *Gasket*	1						
20	**80VI5117**	Vite Screw	1	Acc. al carb. *Carbon steel*					
21	**80COB069**	Coperchio accesso tar. *Calibr.inlet cover*	1	Alluminio *Aluminium*					
22	**80VI8048**	Vite Screw	2	Acc. al carb. *Carbon steel*					
23	**80IN3279**	Ingranaggio *Gear*	1	Acc. al carb. *Carbon steel*					