



144

MIDFLOW[®]

Series 'PT2' Vane meter

Valid for meters with serial numbers 700000 and higher

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**TO BE
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1. PREFACE

1.1 GENERAL

This manual contains installation, operation and maintenance instructions for VAF liquid flowmeters model J5015PT2 (½"), J5023PT2 (1"), J5025PT2(Twin) (1"), J5040PT2(Twin) (1½") and J5050PT2(Twin) (2").

The flowmeter with standard pulse transmitter has an optional temperature transmitter. In this manual both options (standard/dual pulse transmitter, standard/dual pulse and temperature transmitters) are shown.

Please check your order to see which one you have.

This manual contains important information for the installer, the operator and for your maintenance department.



Never use the equipment outside its specifications or beyond common engineering practice nor use the equipment for other applications or make connections to other equipment than explicitly described in the order acknowledgement and/or technical manuals of VAF Instruments.



To ensure safe and correct installation and operation of your VAF flowmeter study this manual carefully before starting operations.

For associated equipment supplied by VAF Instruments B.V. separate instruction manuals are included with those products.

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1.2 SYMBOLS

The symbols below are used to call attention to specific types of information.



A warning to use caution! In some instances, personal injury or damage to the flowmeter or control system may result if these instructions are not followed properly.



An explanation or information of interest.

1.3 COPYRIGHT

This manual is copyrighted with all rights reserved. No part of this book may be copied or reproduced by any means without written permission from VAF Instruments B.V.

While every precaution has been taken in the preparation of this manual, no responsibility for errors or omissions is assumed. Neither is any liability assumed for damages resulting from the use of the information contained herein. Specifications can be changed without notice.

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2. PRODUCT DESCRIPTION

The PT flow meter is used to measure the flow of a fluid. The output of the flowmeter is a Hall switch that is activated by a magnet.

For models J5015PT2 (½") and J5023PT2 (1") the magnets (4pcs) are located in the rotor of the flowmeter. Also models J5025PT2 (1"), J5040PT2 (1,5") and J5050PT2 (2") manufactured from August 2014 have magnets in the rotor.

For previous models (before August 2014) J5025PT2 (1"), J5040PT2 (1,5") and J5050PT2 (2") the magnet(s) is(are) located in one or more vane(s) of the flowmeter. Normally there are two magnets, located on opposite sides of each other (see section 9.3). Options are: 1, 2 or 4 magnets. Models manufactured from July 2017 can be equipped with a dual pulse transmitter (only valid for models J5025PT2Twin (1"), J5040PT2Twin (1,5") and J5050PT2Twin (2")). A PT2Twin meter is always equipped with a red signal cable and a pulse discriminator box as well.

The flowmeter can be equipped with an optional PT100 to measure the temperature of the fluid.

2.1 PRINCIPLE OF OPERATION

These meters operate on the sliding vane principle. The meters consist of a specially shaped housing in which a rotor can rotate freely. Two pairs of vanes are fitted into four slots in the rotor. Each pair is positioned by a rod and can move in and out of the rotor. The radial vane movement is guided by the special inner shape of the housing. This patented construction provides a dynamic seal between the inlet and the outlet of the flowmeter. The incoming liquid forces the rotor to rotate. The rotor rotations are directly measured by a pulse transmitter. The pulse transmitter allows remote flow monitoring or process control.



Note:

These flowmeters are subject to P.E.D, cat 3.3.

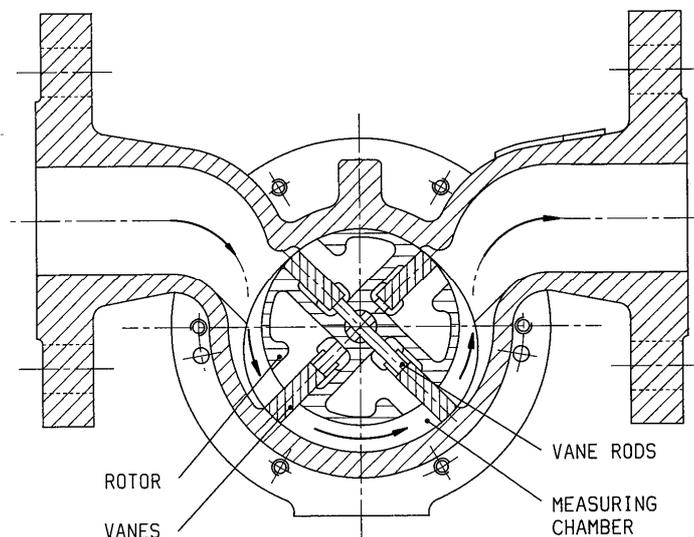
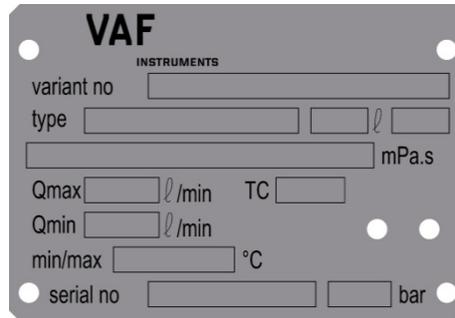


Figure 1 Sectional view of VAF vane meter

3. TECHNICAL SPECIFICATIONS

3.1 FLOWMETER

The technical specification of the flowmeter can be found on the instrument text plate.



3.2 PULSE TRANSMITTER

The flowmeter is equipped with a pulse transmitter for remote flow indication and totalising. The number of generated output pulses is stamped on a text plate.

The parameters in the remote indicators have to be set according the output pulses on the text plate.

3.2.1 Technical specification of pulse transmitter

Type	Omnipolar Hall Switch
Max. supply volts	24V (at 150°C)
Max. supply current	9 mA
Internal resistance	3,4 kOhm (1k2 serial, 2k2 pull-up)
	Pulse out 2x 1k parallel, 22k pull-down
Pulse output	Active, pulse level depends on total circuit resistance*
Cable colour	Black
Wire colour	red (24 V sensor supply), black (gnd) , yellow (pulse)
Type	2 x Omnipolar Hall Switch (PT2Twin meter only)**
Max. supply volts	24V (at 150°C), see chapter 6.5.2
Max. supply current	9 mA
Internal resistance	10 kOhm (10k pull-up)
Pulse output	Active, pulse level depends on total circuit resistance*
Cable colour	Red

* Some connected equipment might need signal conditioning in order to obtain sufficient switching level (e.g. VAF part 0399-0411 with solid state replay output, see chapter 2.1)

** PT2Twin always requires the use of pulse discriminator box (VAF nr. 0379-0424).

3.2.2 Pulses per litre

J5015PT2 and J5023PT2	
<i>Magnets in the rotor</i>	<i>P/L</i>
2	80

J5025PT2(Twin) and J5040PT2(Twin)	
<i>Vanes with magnets or magnets in rotor</i>	<i>P/L</i>
2	12
4	24

J5050PT2(Twin)	
<i>Vanes with magnets or magnets in rotor</i>	<i>P/L</i>
2	5
4	10



Please note that J5025/40/50PT2 flowmeters delivered from august 2014 have magnets in rotor, where previous deliveries were delivered with magnets in vanes.

3.3 TEMPERATURE TRANSMITTER (OPTIONAL)

The flowmeter is equipped with a temperature transmitter for remote temperature indication.

3.3.1 Technical specification of the temperature transmitter

Type	PT100
Temperature range	as indicated on the instrument text plate
Wire colour	Brown (PT100-1), Blue (PT100-2), White (PT100-sense)



Please note that for PT2Twin flowmeters wire colours are not indicated. Please see drawing 0801-2014 for electrical connections.

3.4 WEIGHT OF FLOWMETERS

Flowmeters	Connection size	Approx. net weight (kg)
J5015PT2	DN 15 mm (1/2")	6
J5023PT2	DN 25 mm (1")	7
J5025PT2(Twin)	DN 25 mm (1")	11
J5040PT2(Twin)	DN 40 mm (1 1/2")	13
J5050PT2(Twin)	DN 50 mm (2")	20

4. SAFETY INSTRUCTIONS

- Some calibration fluid can be left in the flow meter. This is Q8 Induco 4 (Q8 Puccini 4P). See chapter 6 for more information.
- Be careful, the flow meter can be heavy, and difficult to handle with one person.

5. UNPACKING

The flowmeter is a precision instrument and should be treated with care.

The two yellow protection caps on the in and outlet of the meter should be left in place as long as possible

Be careful not to put any force on the electrical connection box.

6. INSTALLATION AND FIRST USE

6.1 BEFORE INSTALLING FLOWMETER

1. Identify your flowmeter by comparing the type number on the instrument text plate with the description on the packing list.



Always quote type and serial numbers when contacting the factory.

2. Record data on text plate of flowmeter in the space below.
3. Ensure that the flowmeter is suitable for your process conditions.



Never exceed the capacity, temperature and pressure limits specified on the nameplate of the flowmeter. Consult the factory if the flowmeter must be used for a different process liquid than originally ordered.

4. Store the flowmeter in a safe place. Do not remove dust caps until just before installation.

The image shows a rectangular text plate with a grey background and white text. At the top, it says 'VAF' in large bold letters, followed by 'INSTRUMENTS' in smaller letters. Below this, there are several rows of text with corresponding input boxes: 'variant no' followed by a long box; 'type' followed by two boxes and a 'l' symbol; a box followed by 'mPa.s'; 'Qmax' followed by a box and 'l/min', and 'TC' followed by a box; 'Qmin' followed by a box and 'l/min'; 'min/max' followed by a box and '°C'; and 'serial no' followed by two boxes and 'bar'. There are also four small circles (two on the left and two on the right) that look like mounting holes.

Please fill in the details of your flowmeter here.

Figure 2 Text plate on flowmeter body.

6.2 GENERAL



Read this section carefully before starting the installation work.

1. A VAF flowmeter is a precision instrument. Handle it with care.
2. No special tools are required to install the flowmeter. Ensure that your standard tools are fit for the job.
3. Use the lifting eye, when present, when moving the flowmeter.
4. Make sure the working environment is clean. Ensure that no dirt can enter the flowmeter.
5. Always use personal protective means when working with hot, aggressive and toxic process liquids.
6. Ensure that local safety regulations are met when installing and operating the flowmeter.
7. The sound level of a working flowmeter will always be lower than 70 dB(A).

6.3 SYSTEM LAYOUT RECOMMENDATIONS



WARNING

The flowmeter body will maintain the same temperature as the process liquid. Take measures to avoid personal injury from touching a hot or cold flowmeter. When applying insulation, do not apply this onto the read out counter, but only onto the flowmeter body.

Vibrations and pulsations must be avoided at the position of the flowmeter to ensure trouble free operation of the instrument.

6.3.1 Liquid filter

The liquid to be measured must be clean and free from air, gas or dirt. Solid particles may cause excessive wear. It is recommended to install a VAF liquid filter with a mesh width of ... 0,05 mm (280 mesh) at the inlet of the flowmeter / system.

6.3.2 Bypass

A bypass should be installed, in case the filter or meter need maintenance while the flow of liquid cannot be stopped.

The valve that is installed in the bypass should be a pressure relieve valve. This will prevent a sudden stop of the liquid in case the filter or the flow meter becomes blocked.

6.3.3 To prevent measuring air

Accurate measurement is only possible if it is not influenced by the presence of gas or air. When the process liquid contains gas or air a deaerator should be fitted upstream of the flowmeter.

6.4 TO INSTALL FLOWMETER

1. Remove dust caps from inlet and outlet connections of flowmeter.



Note that some Q8 Induco 4 (Q8 Puccini 4P) calibration liquid may be left in the flow meter.

Q8 Induco 4 (Q8 Puccini 4P) is a refined mineral oil; EG No. 265-158-7, CAS No. 64742-55-8.

2. Install flowmeter to process piping in accordance with the flow direction.



Note that:

- the back cover of the flowmeter must always be in vertical position.
- an arrow on the flowmeter body indicates the direction of the flow.
- do not mount any object onto the flowmeter body

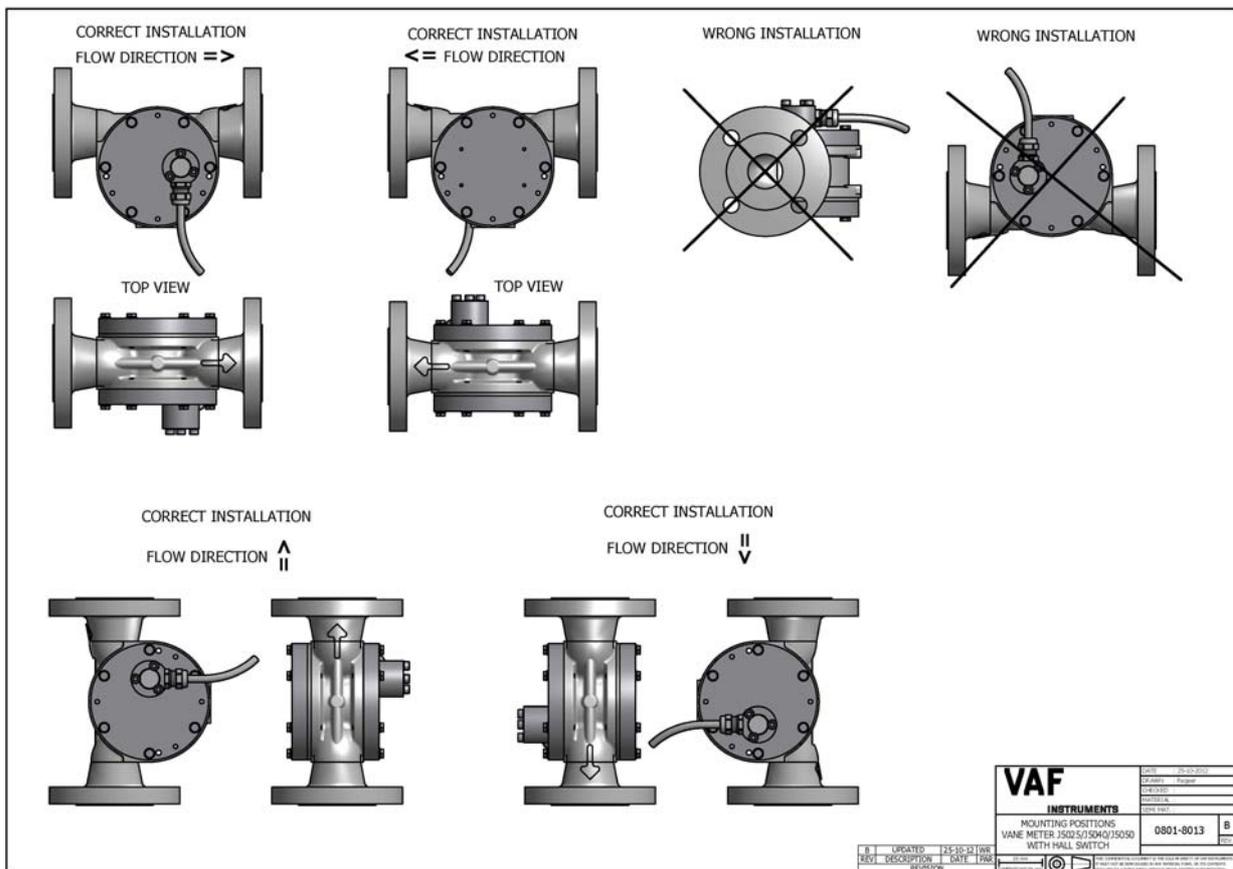


Figure 3 Installation flowmeter

6.5 ELECTRICAL CONNECTIONS

The electrical connections of the pulse transmitter are as shown in figure 4a and 4b. For electrical connections between flowmeter/pulse discriminator box and associated electronic control panel reference is made to the separate technical manuals of these electronic instruments.

Cable specifications:

2 x 3 x 0,5 mm² twisted pair, individually screened.

(Alternative 4 x 2 x 0,5 mm² twisted pair, individually screened)

Shield connected at signal processing side only (please see connection diagram)

Overall cable diameter 5-10 mm



Shield should be interconnected in connection box between flowmeter cable and extension cable

- Make sure that no power supply is applied to the pulse output (yellow wire / marked "2").
- Depending on required switching level and input circuit, signal condition might be necessary.
- Spikes on the power supply should be avoided.
- Spikes on supply will have an impact on output levels and can cause unwanted counting of pulses. Software filtering on spikes is highly recommended in general.

6.5.1 Connection cables

The leads from the pulse transmitter and the temperature transmitter need to be screened separately, as otherwise the electronic signals from the pulse transmitter or temperature transmitter might be disturbed by external electromagnetic fields.

The cables that need to be used are described in the technical manual from the signal processing instrumentation manual, for which this meter is used.

The screens of the cable must only be connected on the signal processing side, and should not be connected at the flowmeter side.

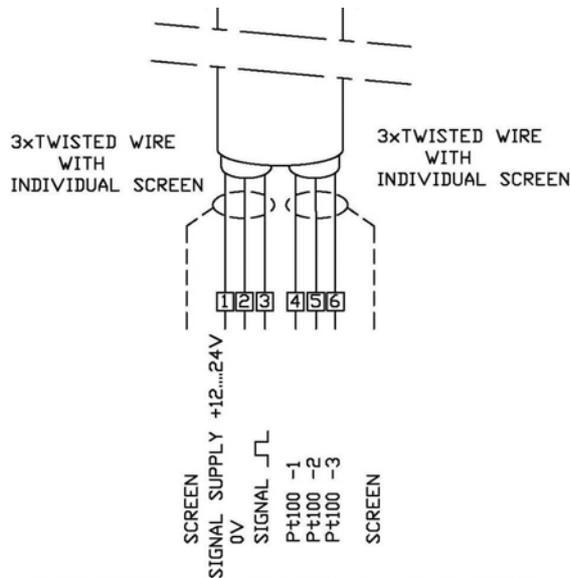


Figure 4a
Electrical connection of standard pulse transmitter (detail of drawing 0801-2007).

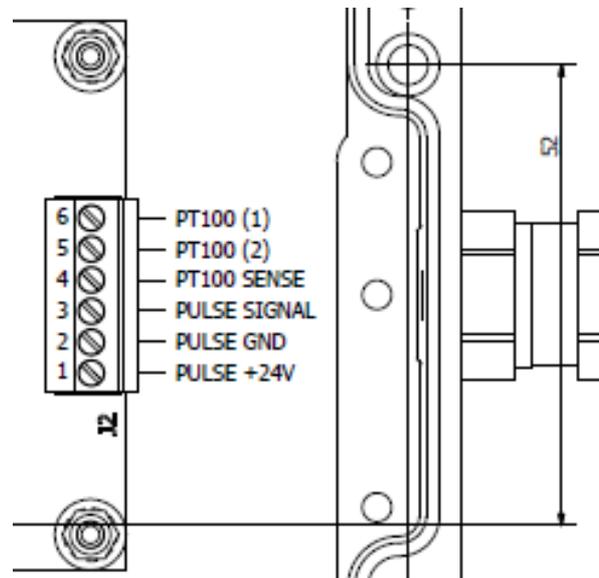


Figure 4b
Electrical connection of pulse transmitter (PT2Twin, detail of drawing 0801-2014).



Please note that for PT2 meter screens should be interconnected in connection box when cables are extended.



Please note that for PT2Twin meters screen wires should be fold back over top of the cable gland insert. Foils have to be cut.

6.5.2 PT2Twin power supply

The PCB located in the pulse discriminator box is equipped with a switch. If the supply voltage to the pulse discriminator is between 8,2 and 24V, the switch should be set to "OFF", the power supply to the sensor will be regulated to 8.2V.

In case the power supply is 8,2V the switch should be set to "ON", the power supply will directly be connected to the sensor (without regulation). See also drawing 0801-2014.

7. OPERATING INSTRUCTIONS

7.1 START-UP PROCEDURES

Before initial start-up of a flowmeter system, or when taking the installation into use again, after a major repair or revision of the piping system, the following procedures are recommended.

1. Remove filter element of liquid filter installed ahead of flowmeter.
2. Remove flowmeter from liquid system and replace it by a pipe piece.
3. Flush entire liquid system to ensure that all dirt and other foreign matter that could damage the flowmeter have been removed.
4. Close valves A, B and C (Fig. 5).
5. Remove flushing pipe piece. Re-install flowmeter and filter element.



CAUTION

Do not flush ductile iron and steel flowmeters with water.

- NEVER exceed maximum flowrate (Q_{max} , see textplate of flowmeter).
- When re-starting the flowmeter measures must be taken to avoid the presence of solidified or cured liquids inside the flowmeter. Failure to do so may result in breaking of the magnet or magnet shaft.

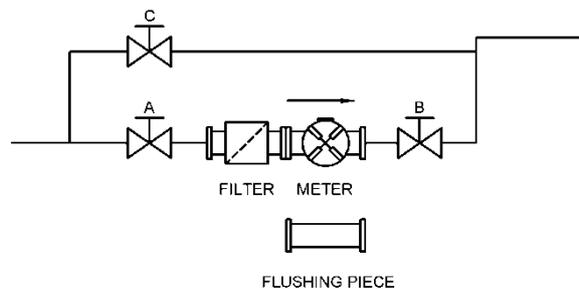


Figure 5 Flowmeter system with bypass

7.1.1 Initial start-up of a flowmeter system with bypass

1. Open bypass valve C completely.
2. Start pump and/or open storage tank valve.
3. Open valve A slightly (5-10%).
4. Slowly open valve B. Dependent on the internal resistance in the system, the flowmeter may start running. If it does, limit the flow to approx. 20% of its capacity.
5. Slowly close bypass valve C until flowmeter just starts running. Let the flowmeter run on this limited flow for a couple of minutes, to ensure that no air or gas will be left in the flowmeter.
6. Slowly open valve A, and if necessary also valve B, completely.
7. Slowly close valve C completely.

7.1.2 Initial start-up of a flowmeter system without bypass

1. Start pump and/or open storage tank valve.
2. Open valve A completely.
3. Slowly open valve B 5 - 10%, until flowmeter just starts running. Let the meter run on this limited flow for a couple of minutes, to ensure that no air or gas will be left in the flowmeter.
4. Slowly open valve B completely.

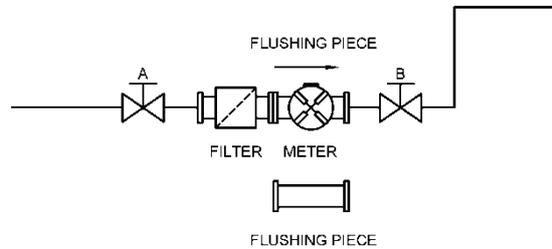


Figure 6 Flowmeter system without bypass

8. MAINTENANCE

8.1 GENERAL

Under normal operating conditions the flowmeter requires no maintenance other than: Periodic accuracy check. Refer to chapter 8.2.



For flowmeters that are running continuously, we recommend to inspect bearings every year as a preventive measure to keep the flowmeter in the best possible condition. In case of damage or wear, they should be replaced.

8.2 ACCURACY CHECK

The calibration interval will depend on the nature of the process liquid, the operating conditions, and user requirements due to internal procedures.

For industrial (non-marine) applications this will typically be once per year or once per two years, based on clean and non-abrasive liquids.

9. SERVICE AND REPAIR INSTRUCTIONS

9.1 GENERAL

This chapter describes the procedures to be followed when a flowmeter must be removed from the process line for service or repair.

When re-assembling the flowmeter, the following tightening torque values can be used:

	Bolt type	Torque [Nm]
Cover J5015/23PT2	M6	8,5-9
Cover J5025/40PT2	M6	8,5-9
Cover J5050PT2	M8	16-17
PT2 pulstransmitter	M6	8,5-9

9.2 TO REMOVE FLOWMETERS FROM PIPING SYSTEM



When removing a flowmeter from the piping system precautions must be taken to prevent personal injuries and damage to the flowmeter and process control installation.

- * Always wear protective clothing when the flowmeter contains a toxic or aggressive fluid.
- * Use a hoist or other lifting device and the lifting eye on top of the flowmeter to support the flowmeter when removing from the process piping.



Do not use steam or air to empty the pipe system. This will most likely cause an over speeding of the flow meter and cause damage to the vanes and or the house.

9.2.1 To remove flowmeter from piping system

1. Ensure that flow through the flowmeter has stopped.



Although the flow has stopped, the flowmeter can still be under pressure. Be careful when loosening bolts on inlet and outlet flanges.

1. Ensure the signal processing instrumentation has been switched off and no power is present on the wires connected to the meter.
2. Ensure all electrical wiring is marked with the correct number and removed from the flowmeter. (See chapter 9.2.2)
3. Use a lifting device and the lifting eye on top of the flowmeter to hold flowmeter in position.
4. Remove flowmeter from piping system.



When the flowmeter has been removed from the piping system there will still be some liquid left in its measuring chamber.

1. Hold meter outlet in downward position and let flowmeter leak out for approximately ten minutes. High viscosity liquids will perhaps require more time.
2. Place flowmeter on a dry and clean workbench.

9.2.2 Instructions to exchange pulse transmitter in cover.



Never remove the pulse transmitter while the flowmeter is still in the system.



Figure 7

Remove the bolts and washers



Figure 8



Figure 9



Figure 10

Remove complete holder including o-ring out of cover.
Replace o-ring if damaged. O-ring is placed in o-ring groove from sensor assembly (Figure 10)



For models J5015PT2 (½") and J5023PT2 (1") the orientation of the pulse transmitter is according figure 11.

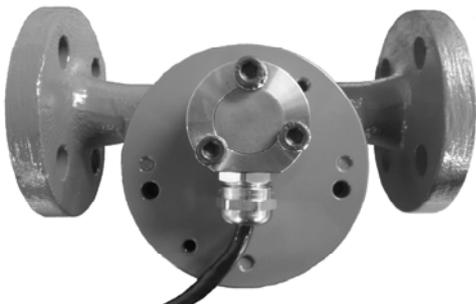


Figure 11

9.2.3 To remove the back or front cover

If the flow meter needs to be disassembled, it should preferably done by removing the back cover. In this way there is less change of damaging the connection box and wiring of the pulse transmitter.



Figure 12



Figure 13

1. Remove the cover mounting bolts and lock washers. (Figure 12)
2. Install the bolts that were removed in step 1, in the jacking position of the back cover. Tighten these bolts evenly turn by turn, until the cover frees (Figure 13). Ensure the cover is lifted equally to avoid the locating pins from being damaged.

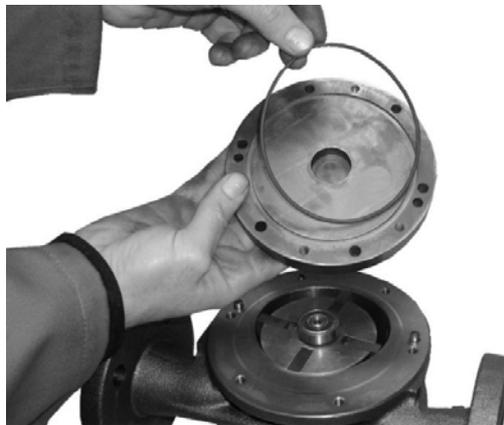


Figure 14

3. Lift the cover and remove the bolts and the o-ring. (Figure 14).

9.2.4 Instructions to exchange the vanes from the flowmeter

1. Remove the back or front cover of the flowmeter. Preferably the back cover. (See chapter 9.2.3)
2. Before taking the rotor out of the meter body, visually inspect the inside of the body to find possible cause of damage. If vanes appear to be broken, ensure that the vane push rods will not scratch against the inner wall of the meter body, when the rotor is pulled out.
3. Record how the rotor is installed in the meter body and record how the vanes are installed in the rotor.
4. Put the meter on horizontally, as shown on the picture, on a table or workbench.



Figure 15

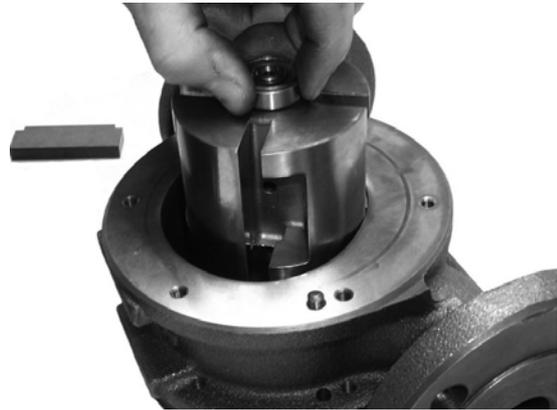


Figure 16

5. First remove the vanes (Figure 15)
6. Carefully remove the rotor making sure the vane push rods do not touch the inside of the house. (Figure 16).



For models J5015PT2 (½") and J5023PT2 (1") the bearings are mounted in the cover and for models J5025PT2 (1"), J5040PT2 (1½") and J5050PT2 (2") the bearings are connected to the rotor.



Figure 17

Clean rotor, vanes and push rods with diesel oil.

After the rotor, vanes, push rods and bearings are inspected, they can be placed back in the flowmeter house.

7. Place the push rods inside the rotor before placing back the rotor in the flowmeter housing. (Figure 17)

8. Put the rotor back in the flowmeter housing (Figure 18)

 For models J5015PT2 (½"), J5023PT2 (1") and J5025/40/50PT2 (manufactured after August 2014) the magnets (2 or 4 pcs) are installed in the rotor and need to face the pulse transmitter.



Figure 18

9. Install the vanes back in the rotor (Figure 19). The position of the chamfer on the vane must face in the right direction shown in figure 20.

 Make sure that for previous (manufactured before August 2014) models J5025PT2 (1"), J5040PT2 (1½") and J5050PT2 (2") the magnets are on the same side where the pulse transmitter is. If the flow meter has two magnets, install the vanes with the magnets on opposite side of each other.



Figure 19

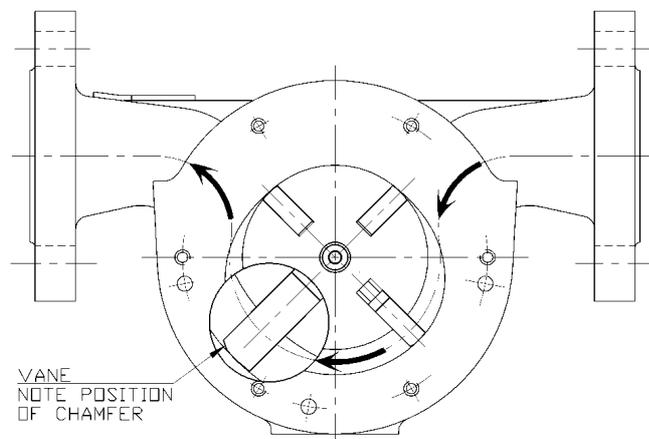


Figure 20

FLOWMETER WITH BACKCOVER REMOVED

9.3 POSITION OF THE MAGNETS

9.3.1 Magnets in the rotor

For VAF liquid flowmeters model J50xxPT2 delivered from August 2014, the magnets (2 or 4 pcs) are installed in the rotor. J5015/23PT2 are only manufactured with magnets in the rotor.

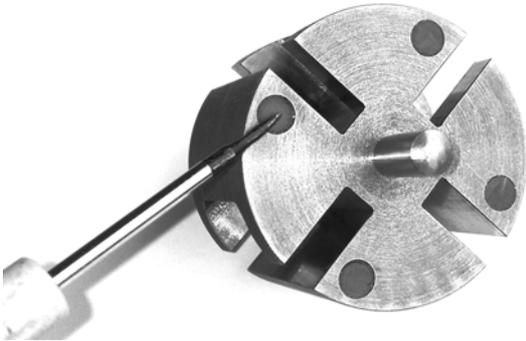


Figure 21 – Rotor with small magnets



WARNING:

The rotor has small magnets installed on one side only (Figure 21) If the (new) rotor is re-installed in the wrong way, there will be no activation of the Hall-switch and therefore the flow indicator connected to the meter will show zero. Figure 24.

9.3.2 Magnets in the vanes

For VAF liquid flowmeters model J5025/40/50PT2 delivered before August 2014, the magnets (1,2 or 4pcs) are installed in the vanes.

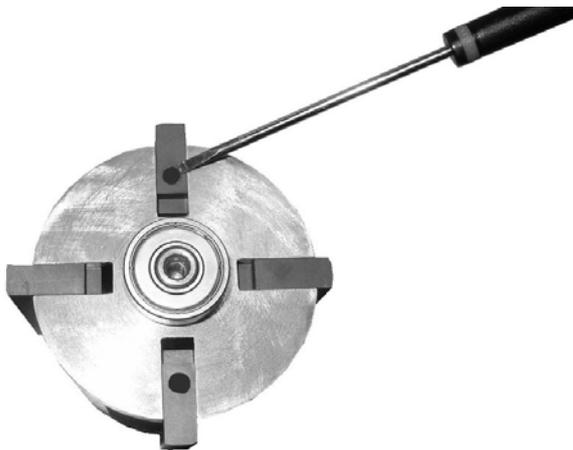


Figure 22 – Vanes with small magnets

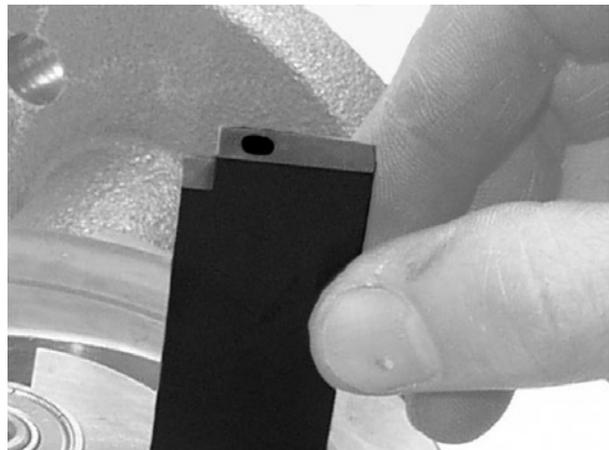


Figure 23



WARNING:

The vanes have small magnets installed on one side only (Figure 22/23). If rotor or one or more (new) vanes are re-installed in the wrong way, there will be a wrong or even no activation of the Hall-switch and therefore the flow indicator connected to the meter will show a wrong flow or even zero (fig. 24). In a flowmeter with two vanes with magnets, the vanes with the magnets are placed opposite of each other.

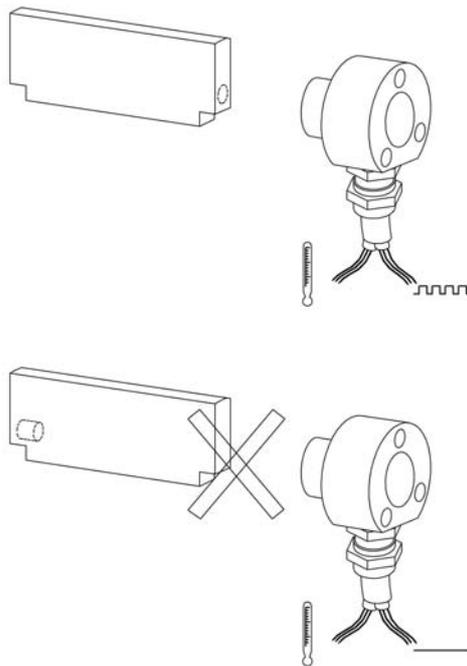


Figure 24

9.4 TO REPLACE BEARINGS

1. Remove old bearing out of the cover or from rotor shaft using a suitable bearing puller.

- For flowmeters model J5015PT2 (½") and J5023PT2 (1") an *internal bearing puller* needs to be used. (Figure 25)
- For flowmeters model J5025PT2 (1"), J5040PT2 (1½") and J5050PT2 (2") an *external bearing puller* needs to be used. (Figure 26)



Because the space between bearings and rotor is approximately 2 mm, this operation requires a puller with thin blades.

2. Press the new bearing vertically in the cover or on the rotor shaft using an arbor press.



Figure 25

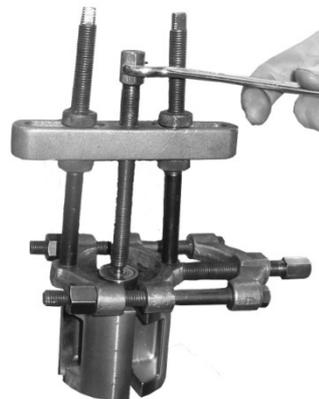


Figure 26

10. TAKE OUT OF SERVICE

If the flowmeter has to be taken out of service follow the instructions in chapter 9 (repair) to remove the flow meter from the system. Flush the flow meter with a clean non corrosive fluid, like light diesel oil, or kerosene. The flow meter should than be emptied as much as possible. The inlet and outlet must be closed off to prevent dirt or other particals entering the flow meter. This can damage the flow meter.

11. REMOVAL AND STORAGE OF EQUIPMENT

Follow the instruction in chapter 9 (repair) to remove the flow meter from the system. Flush the flow meter with a clean non corrosive fluid, like light diesel oil, or kerosene. The flow meter should than be emptied as much as possible. The inlet and outlet must be closed off to prevent dirt or other particals entering the flow meter. This can damage the flow meter. It should be stored and secured in a save place. If the flow meter is stored for a longer period of time, it should be treated inside with a corrosion prevention liquid.

12. MALFUNCTION AND SEND FOR REPAIR

In case the flow meter stops working and cannot be repaired on site, it should be send back for repair.

Follow the instructions in Chapter 11 (Removal and storage of equipment).

The shipping container or wooden box must be strong enough to protect the flow meter during transport.

The flow meter should be packed with soft material to protect it against shock's.

A fault report should accompany the flow meter, stating the fault, which fluid the meter was used for and all other information that is important to speed up the repair.

13. ENVIRONMENT

The flow meter has no negative influence for the environment it is placed in.

The noise the meter is producing in normal circumstances is below 70 dB (A).

14. DISPOSAL

Laws and restrictions for disposal of equipment will be different in most counties. If in doubt or unable to dispose the equipment it can be send back to VAF Instruments.

VAF Instruments will dispose the equipment in a correct way.

Main materials:

Body	Ductile iron
Rotor	Ductile iron
Vanes	Carbon

15. TROUBLE SHOOTING

15.1 TROUBLE SHOOTING CHART

Problem:

The flowmeter does not indicate any flow, although the liquid is flowing.

Possible cause

Solution

(Perform a check in the following order)

- | | |
|---|--|
| 1. The valve in the bypass line is still open. | Close bypass valve. |
| 2. Inner parts of flowmeter may be stuck or broken. | Refer to chapter 9. |
| 3. The electrical connection between the flowmeter and the flow indicator is broken | Check wires and connections |
| 4. The Hall switch is mal functioning | Replace pulse/temperature transmitter. |
| 5. The rotor or the vanes with magnets are inserted wrong | Refer to chapter 9. |
| 6. No power supply to Hall switch | Connect 24 V sensor supply.
(See specifications). |

Problem:

The flowmeter does not indicate any flow and no liquid is passing through the flowmeter.

Possible cause

Solution

(Perform a check in the following order)

- | | |
|--|---|
| 1. Obstructions in the liquid piping, blocking the flow. | Check for obstructions, e.g. closed valves.
If this does not solve the problem, proceed with next step. |
| 2. The dust cap in the inlet and/or outlet connection of the flowmeter was not removed when the flowmeter was installed in the process line. | Remove dust cap(s) and check the flowmeter for damage. If there are no visible signs of damage, proceed with next step. |
| 3. Dirt is blocking the vanes and/or the rotor of the flowmeter. | Flush the flowmeter with a suitable solvent.
If this does not solve the problem, return the flowmeter to the factory or nearest authorized VAF Instruments service representative. |
| 4. Inner parts of the flowmeter may be stuck or broken. | Refer to chapter 9. |

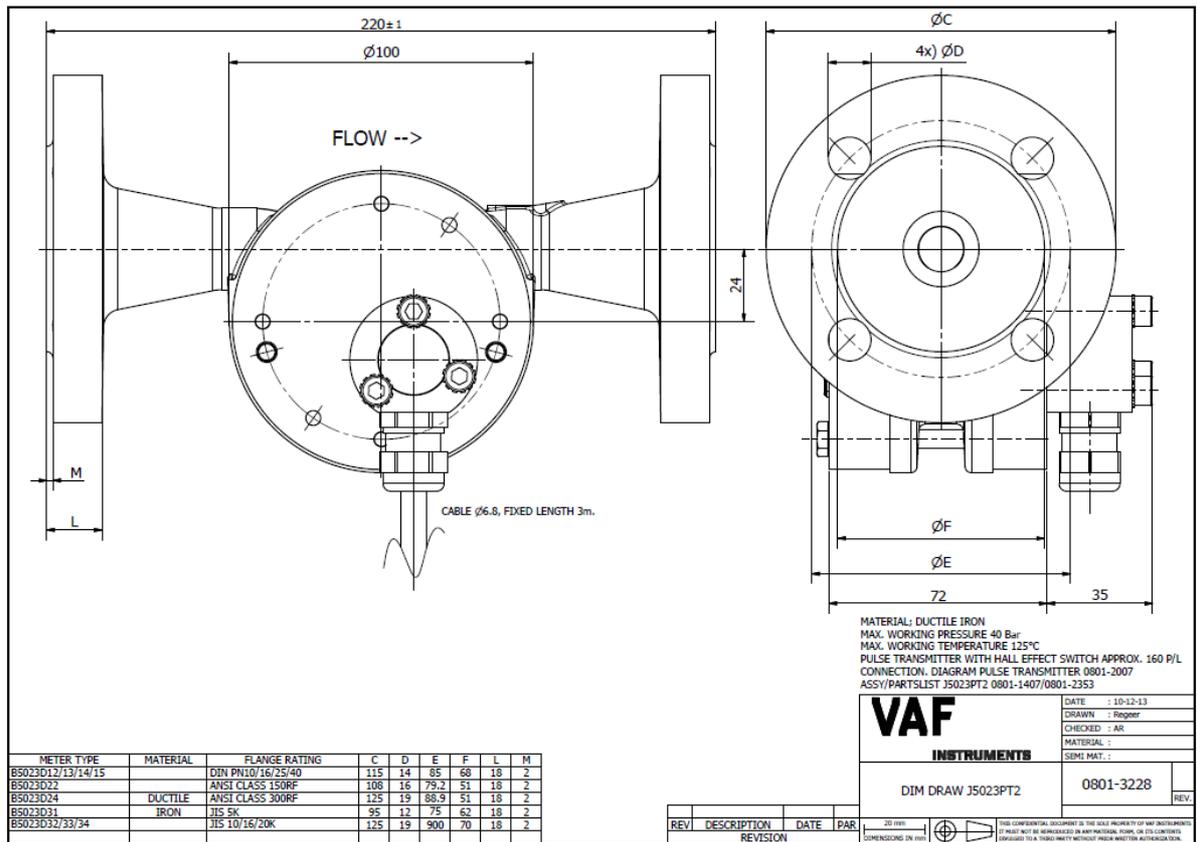


Figure 28 – Dimensions Flowmeter J5023PT2

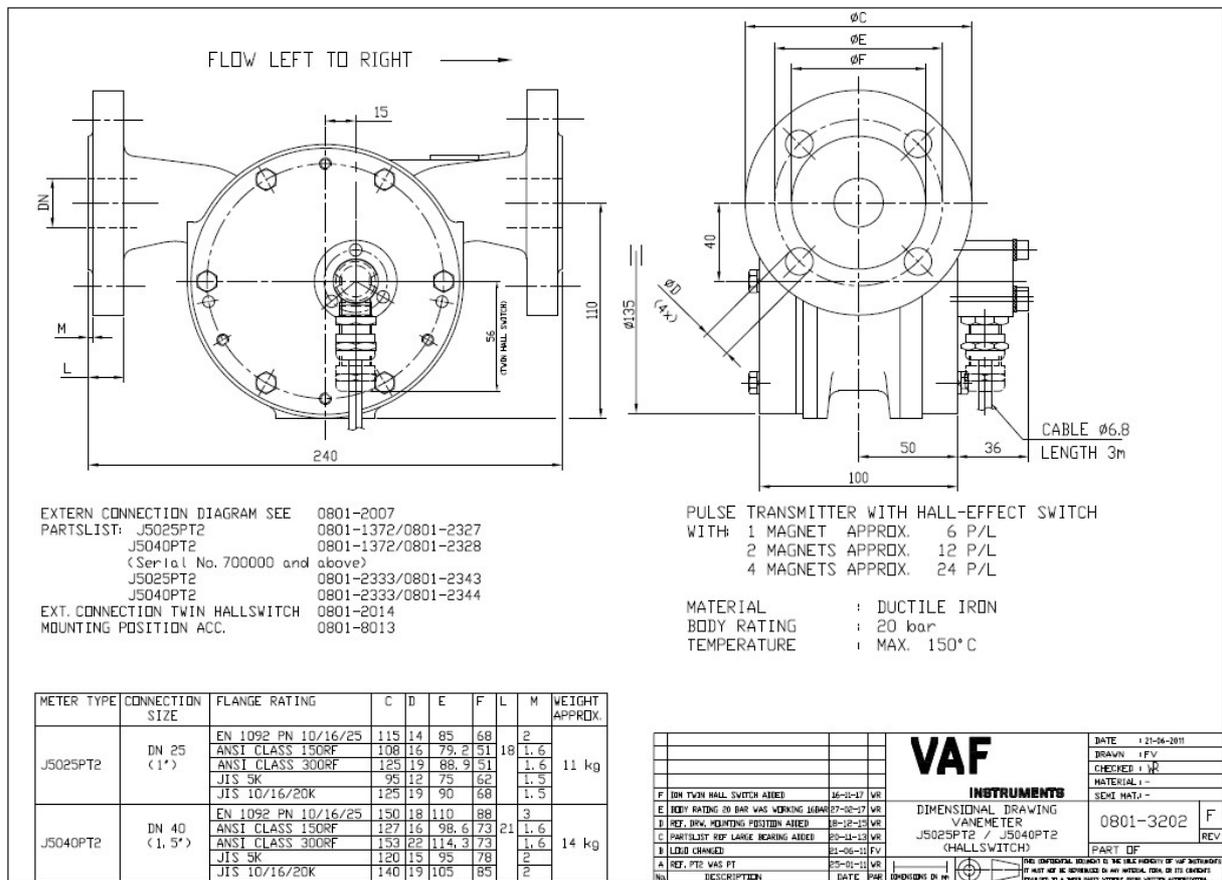


Figure 29 – Dimensions Flowmeter J5025PT2 and J5040PT2

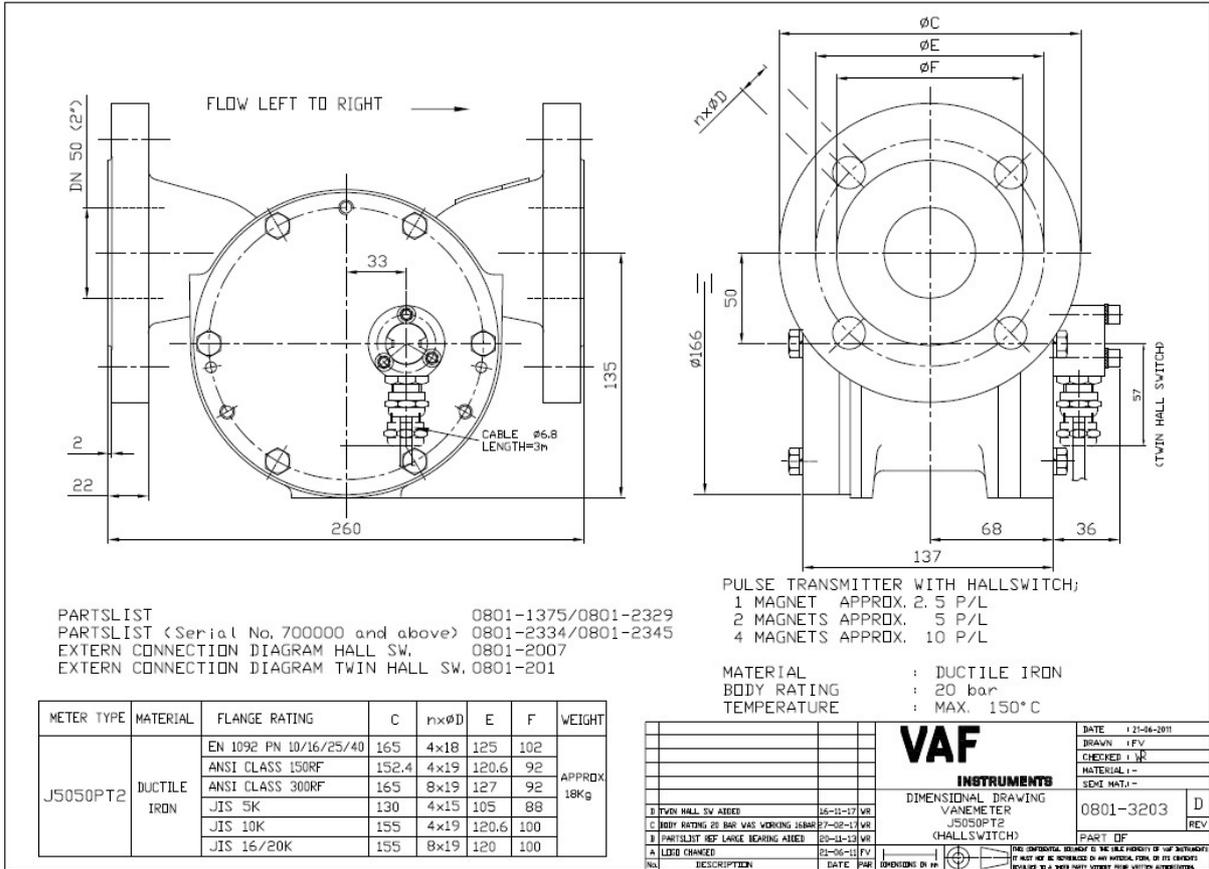


Figure 30 – Dimensions Flowmeter J5050PT2

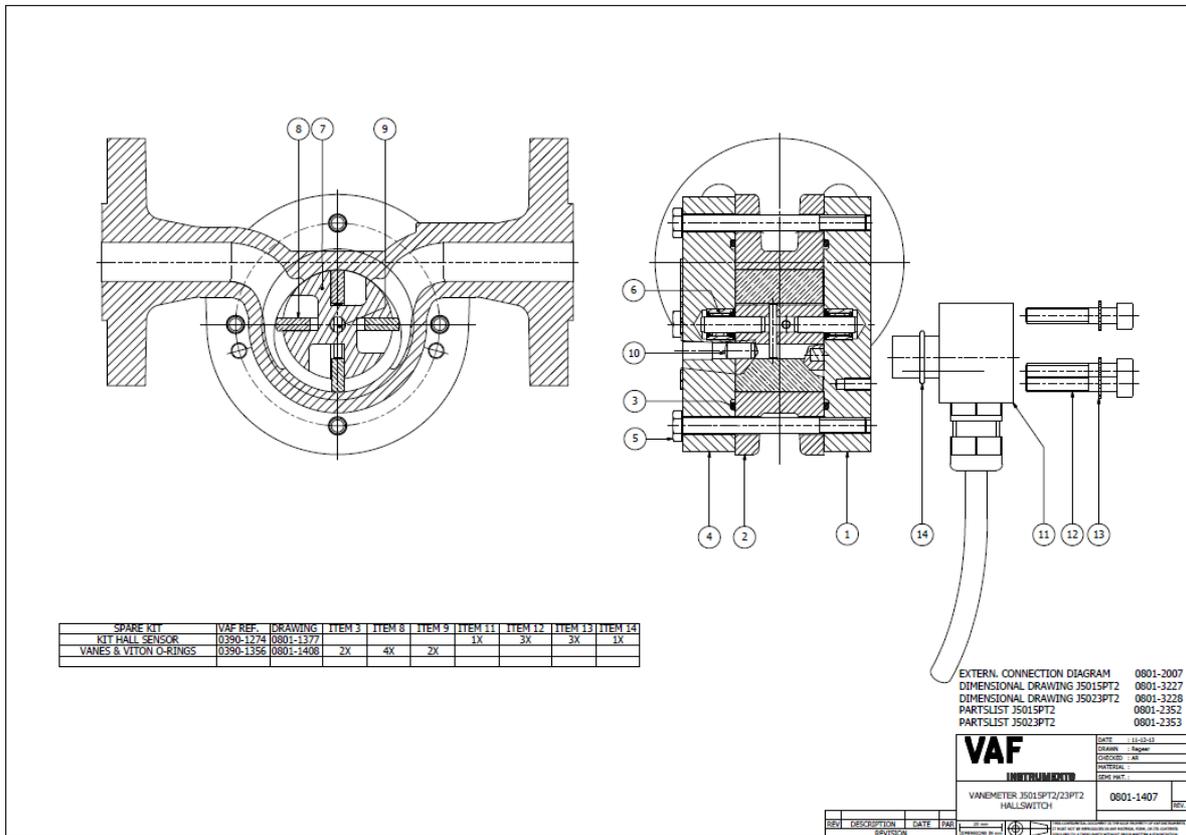


Figure 31 – Assembly Flowmeter J5015PT2 and J5023PT2

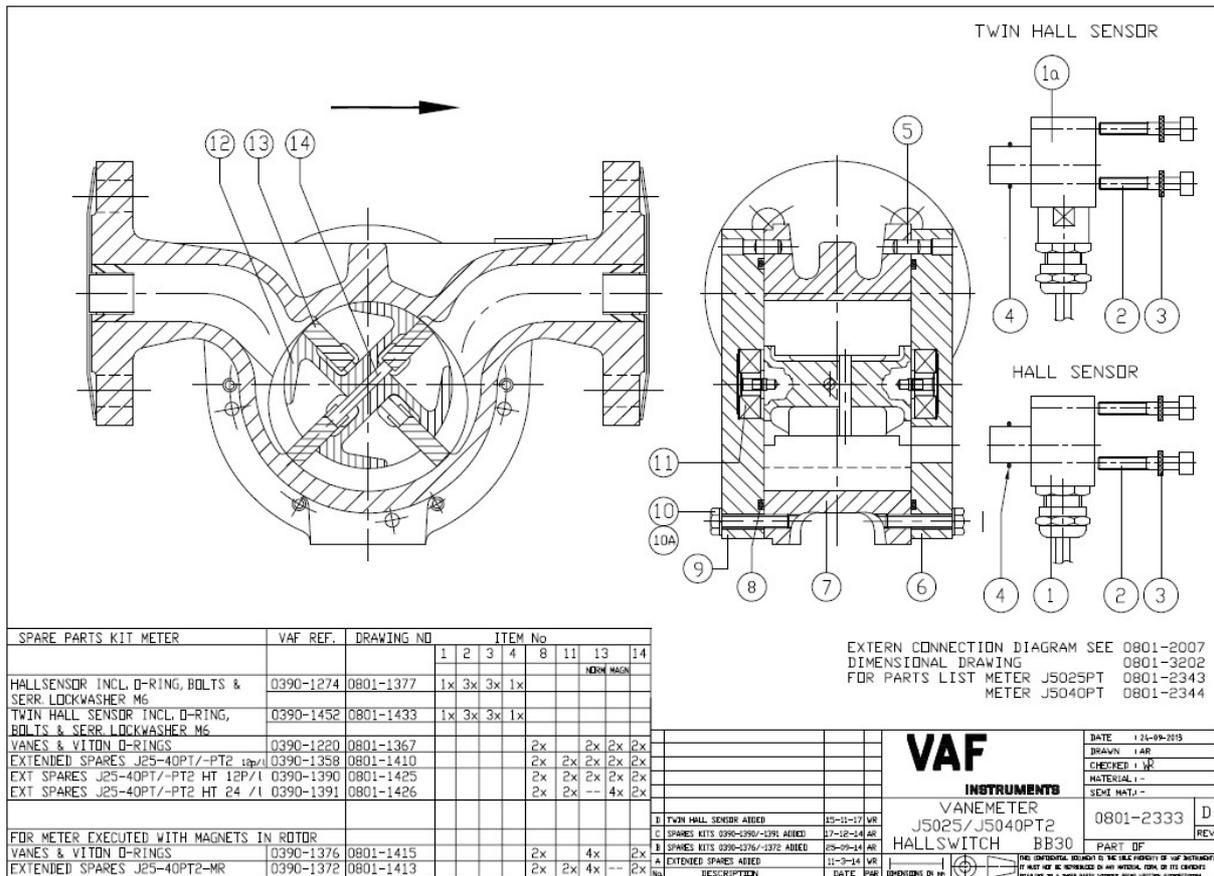


Figure 32 – Assembly Flowmeter J5025PT2 and J5040PT2

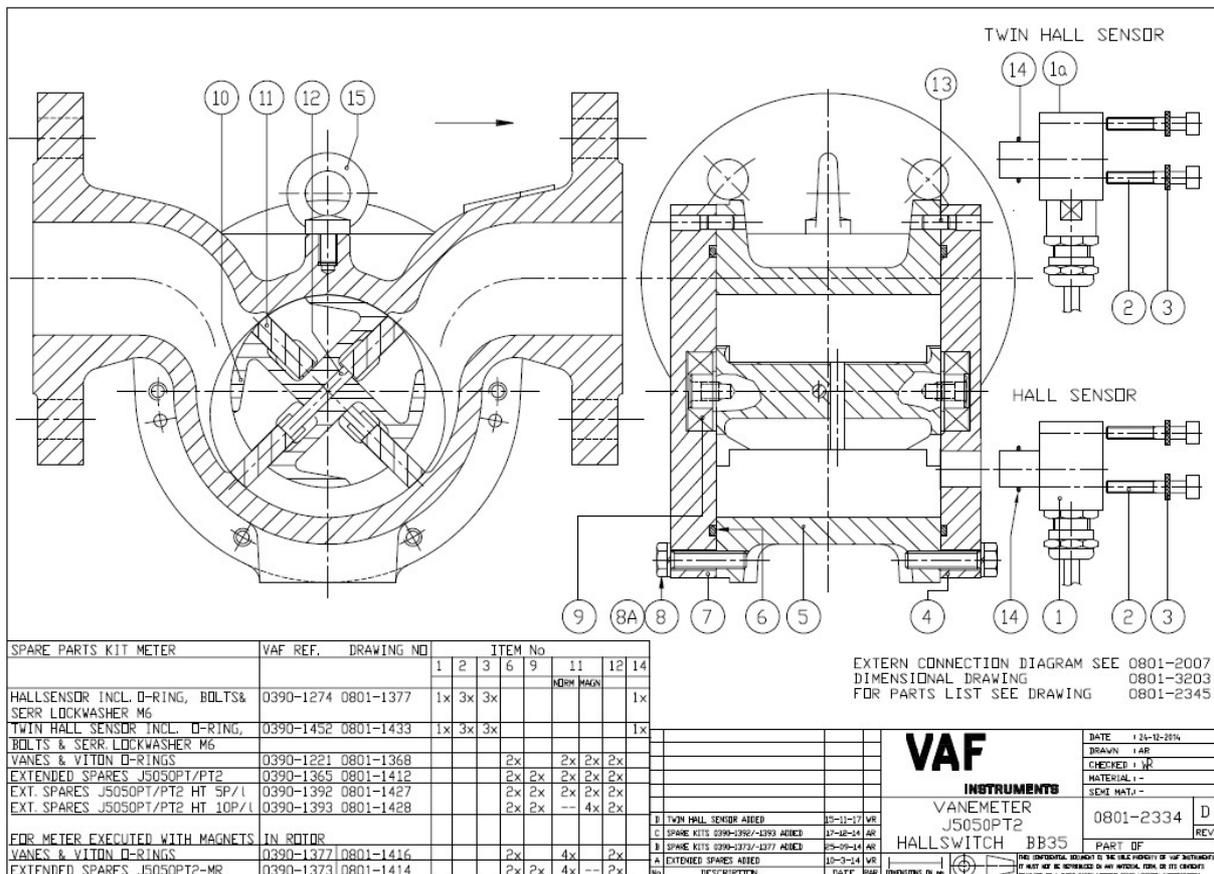


Figure 33 – Assembly Flowmeter J5050PT2

ITEM No.	PART NUMBER	QTY	PART NAME	MATERIAL
1	0302-0265	1	COVER, FRONT, INCLUDING 1xITEM 11, #98x18mm	DUCTILE IRON
2		1	HOUSING, INCLUDING ITEM No. 16	DUCTILE IRON
	0401-0439		FLANGE, DIN PN10/16/25/40	
	0401-0440		FLANGE, ANSI CLASS 150RF	
	0401-0441		FLANGE, ANSI CLASS 300RF	
	0401-0583		FLANGE, JIS 5K	
	0401-0442		FLANGE, JIS 10/16/20K	
3		2	O-RING, ID 59.99 x #2.62 mm	
	0630-3142		STANDARD	VITON
4	0302-0170	1	COVER, BACK, INCLUDING 1xITEM 11, #98x20mm	DUCTILE IRON
5	0732-0670	4	BOLT, HEX, HEAD, M6x70 mm, DIN 931	STEEL 8.8
6	0604-0020	2	BEARING, NEEDLE, OD 12xID 6x10 mm	STEEL
7		1	ROTOR, ASSY, OD 42/6x76 mm	DUCTILE IRON/ STEEL, HRD.
	0303-0220		STANDARD, INCLUDING 4xMAGNET	
8		4	VANE, 33.6x13x5 mm	CARBON
	0405-0031		STANDARD	
9	0404-0136	2	ROD, VANE, #3x21 mm	AISI 316, HRD.
10	0705-0612	4	PIN, DOWEL, D=6m6, L=12 mm, DIN 6325	STEEL, HRD.
11	0308-0067	1	ASSY PULSE TRANSMITTER PT2	AISI 316
12	0728-0635	3	HEX HD CAP SCREW M6x35 DIN912	STEEL 12.9
13	0799-0047	3	SERR, LOCK WASHER A6.4 DIN 6798	AISI 304
14	0630-3017	1	O-RING ID 17.17x1.78	VITON

ASSEMBLY METER SEE DRAWING 0801-1407

			VAF	DATE	11-12-13
				DRAWN	J. Regeer
			INSTRUMENTS	CHECKED	J. AR
				MATERIAL	DUCTILE IRON
			PARTS LIST METER J5015PT2	SEMI MAT.	-
				0801-2352	-
				PART OF	REV
			PART OF		
No.	DESCRIPTION	DATE	PAR	DIMENSIONS IN MM	



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Figure 34 – Parts list Flowmeter J5015PT2

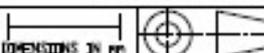
ITEM No.	PART NUMBER	QTY	PART NAME	MATERIAL
1	0308-0067	1	HOLDER HALL SWITCH	
1a	0308-0071		HOLDER TWIN HALL SENSOR	
2	0728-0635	3	HEX HEAD CAP SCREW M6x35 DIN 912	STEEL 12.9
3	0799-0047	3	SERR LOCKWASHER M6 DIN 6798	SS304
4	0630-3017	1	O-RING I. D. 17.17xø1.78mm	VITON
5	0705-0612	4	PIN, DOWEL, ø6m6 x 12 mm DIN 6325	STEEL, HRD.
6	0402-0637	1	COVER, FRONT, ø135x18mm	DUCTILE IRON
7		1	HOUSING, INCLUDING ITEM No. 5	DUCTILE IRON
	0401-0352		FLANGE, EN 1092 PN10/16/25/40	
	0401-0353		FLANGE, ANSI CLASS 150RF	
	0401-0354		FLANGE, ANSI CLASS 300RF	
	0401-0431		FLANGE, JIS 5K	
	0401-0396		FLANGE, JIS 10/16/20K	
8	0630-3155	2	O-RING, ID 101.27 x ø2.62 mm	VITON
9	0402-0636	1	COVER BACK, ø135 x 18 mm	DUCTILE IRON
10	0733-0630	12	HEX. HEADSCREW M6 x 30 mm DIN 933	STEEL 8.8
10A	0718-0600	12	SPRING WASHER M6, DIN 127	SPRING STEEL
11		2	BEARING, BALL, OD 30 X ID 10 X 9 mm	STEEL
	2601-6200		STANDARD WITH 2 GUARD PLATES	
	0601-7010		HIGH TEMP	
12		1	ROTOR, OD 73/10 x 64/84 mm	DUCTILE IRON
	0403-0138		STANDARD (MAGNET IN VANE)	
	0303-0223PH		ASSY ROTOR+MAGNETS (1X) 6 P/L	
	0303-0224PH		ASSY ROTOR+MAGNETS (2X) 12 P/L	
	0303-0225PH		ASSY ROTOR+MAGNETS (4X) 24 P/L	
13		4	VANE, 64 x 24 x 8 mm	CARBON
	0405-0029	*	STANDARD	
	0305-0004	*	ASSY VANE L-R WITH MAGNET	
14	0404-0126	2	ROD, VANE ø5 x 35 mm	AISI 316, HRD.

* QTY SEE THIS TABLE

METER WITH MAGNETS IN VANES				
VANE	0405-0029	3x	2x	0x
ASSY VANE	0305-0004	1x	2x	4x
P/L APPROX.		6	12	24
METER WITH MAGNETS IN ROTOR				
VANE	0405-0029	4x		

METER ASSEMBLY SEE DRAWING 0801-2333

			VAF	DATE	12-09-2013
				DRAWN	AR
			INSTRUMENTS	CHECKED	WR
				MATERIAL	-
				SEMI MAT.	-
			PARTS LIST METER J5040PT2 HALLSWITCH	0801-2344	D
					REV
				PART OF	
-	-	-			
D	ITEM 1a ADDED	26-11-17	WR		
C	ITEM 1b CORR. SWAPPED -0223/0225	29-08-17	AR		
B	ITEM 2 CORR. MATR. WAS 8.8	15-05-17	WR		
A	ADDED ASSY ROTOR+MAGNETS	25-09-14	AR		
No.	DESCRIPTION	DATE	PAR	DIMENSIONS IN mm	



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Figure 37 – Parts list Flowmeter J5040PT2

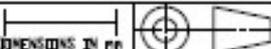
ITEM No.	PART NUMBER	QTY	PART NAME	MATERIAL																														
1	0308-0067	1	HOLDER HALLSWITCH																															
1a	0308-0071		HOLDER TWIN HALL SWITCH																															
2	0728-0635	3	SCREW, HEX. HEAD M6 x 35mm DIN 912	STEEL 12.9																														
3	0799-0047	3	SERR. LOCKWASHER M6 DIN 6798	SS304																														
4	0402-0650	1	COVER, FRONT, $\phi 166 \times 18$ mm	DUCTILE IRON																														
5		1	HOUSING, INCLUDING ITEM No. 13	DUCTILE IRON																														
	0401-0393		FLANGE, EN 1092 PN10/16/25/40																															
	0401-0394		FLANGE, ANSI CLASS 150RF																															
	0401-0395		FLANGE, ANSI CLASS 300RF																															
	0401-0482		FLANGE, JIS 5K																															
	0401-0481		FLANGE, JIS 10K																															
	0401-0607		FLANGE, JIS 16/20K																															
6	0630-3248	2	O-RING, ID 120.24 x $\phi 3.53$ mm	VITON																														
7	0402-0645	1	COVER, BACK, $\phi 166 \times 20$ mm	DUCTILE IRON																														
8	0733-0835	12	SCREW, HEX. HEAD, M8 x 35 mm, DIN 933	STEEL 8.8																														
8A	0718-0800	12	SPRING WASHER M8, DIN 127	SPRING STEEL																														
9		2	BEARING, BALL, OD 35 X ID 15 X 11 mm	STEEL																														
	2601-6202		STANDARD WITH 2 GUARD PLATES																															
	0601-7011		HIGH TEMP																															
10		1	ROTOR, OD 86/15 x 99/122 mm	DUCTILE IRON																														
	0403-0139		STANDARD (MAGNET IN VANE)																															
	0303-0226PH		ASSY ROTOR+MAGNETS (1X) 2,5 P/L																															
	0303-0227PH		ASSY ROTOR+MAGNETS (2X) 5 P/L																															
	0303-0228PH		ASSY ROTOR+MAGNETS (4X) 10 P/L																															
11		4	VANE, 99 x 30 x 10 mm	CARBON																														
	0405-0030	*	STANDARD																															
	0305-0005	*	ASSY VANE L-R WITH MAGNET																															
12	0404-0127	2	ROD, VANE $\phi 6 \times 39$ mm	AISI 316, HRD.																														
13	0705-0612	4	DOWELPIN $\phi 6m6 \times 12$ mm DIN 6325	STEEL, HRD.																														
14	0630-3017	1	O-RING ID $\phi 17.17 \times \phi 1.78$ mm	VITON																														
15	0799-0079	1	EYE BOLT, M8 DIN 580	STEEL, HRD.																														
* QTY SEE THIS TABLE																																		
<table border="1"> <thead> <tr> <th colspan="5">METER WITH MAGNETS IN VANES</th> </tr> </thead> <tbody> <tr> <td>VANE</td> <td>0405-0030</td> <td>3x</td> <td>2x</td> <td>0x</td> </tr> <tr> <td>ASSY VANE</td> <td>0305-0005</td> <td>1x</td> <td>2x</td> <td>4x</td> </tr> <tr> <td>P/L APPROX.</td> <td></td> <td>2.5</td> <td>5</td> <td>10</td> </tr> <tr> <th colspan="5">METER WITH MAGNETS IN ROTOR</th> </tr> <tr> <td>VANE</td> <td>0405-0030</td> <td>4x</td> <td></td> <td></td> </tr> </tbody> </table>					METER WITH MAGNETS IN VANES					VANE	0405-0030	3x	2x	0x	ASSY VANE	0305-0005	1x	2x	4x	P/L APPROX.		2.5	5	10	METER WITH MAGNETS IN ROTOR					VANE	0405-0030	4x		
METER WITH MAGNETS IN VANES																																		
VANE	0405-0030	3x	2x	0x																														
ASSY VANE	0305-0005	1x	2x	4x																														
P/L APPROX.		2.5	5	10																														
METER WITH MAGNETS IN ROTOR																																		
VANE	0405-0030	4x																																
ASSEMBLY METER SEE DRAWING 0801-2334																																		
			VAF	DATE : 24-09-2013																														
				DRAWN : AR																														
				CHECKED : WR																														
				MATERIAL : DUCTILE IRON																														
				SEMI MAT. : -																														
			INSTRUMENTS																															
			PARTS LIST METER J5050PT2 HALLSWITCH	0801-2345																														
				E REV																														
				PART OF																														
No.	DESCRIPTION	DATE	PAR																															
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Figure 38 – Parts list Flowmeter J5050PT2

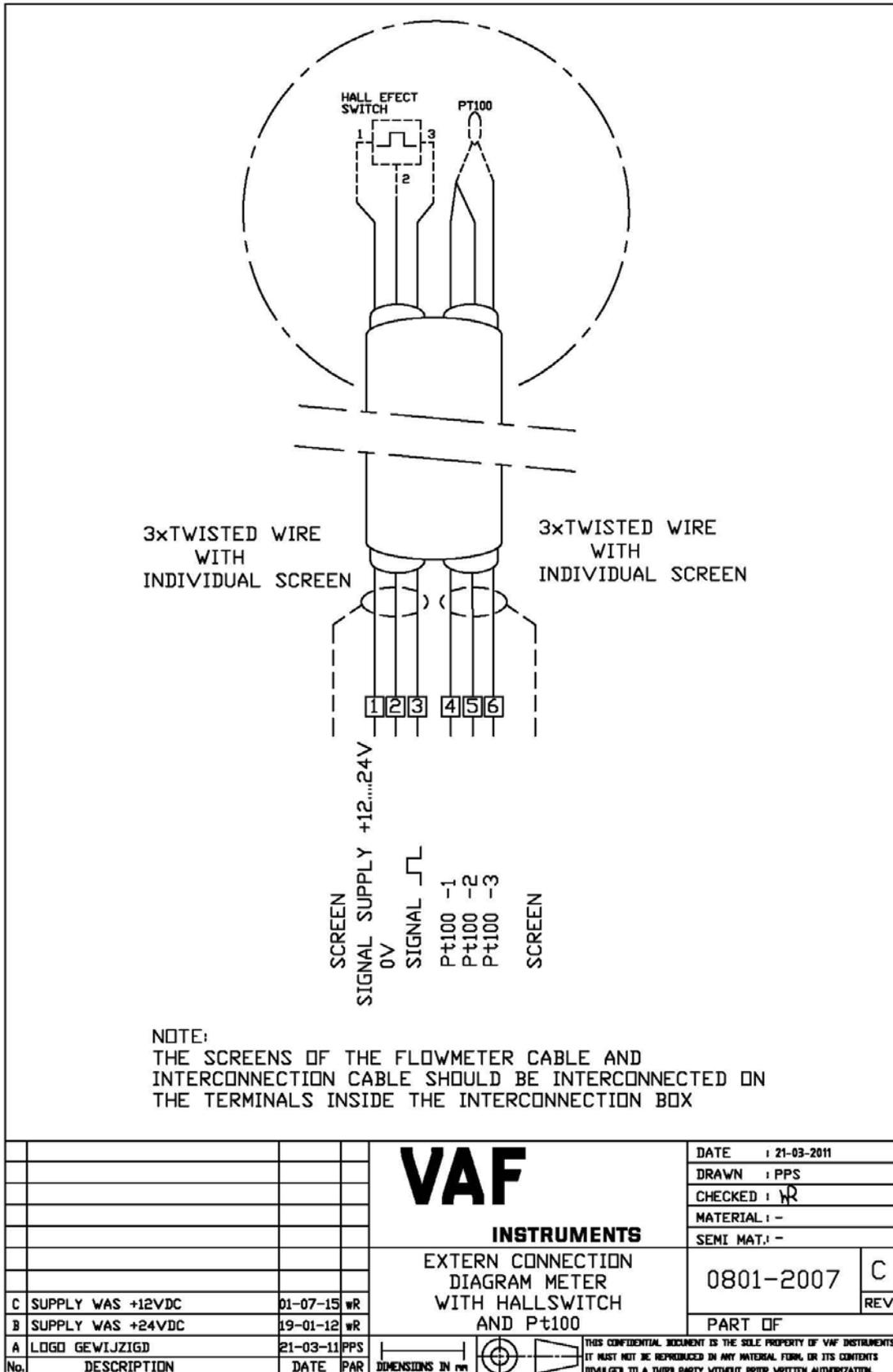


Figure 39 – Connection diagram PT2 flowmeter

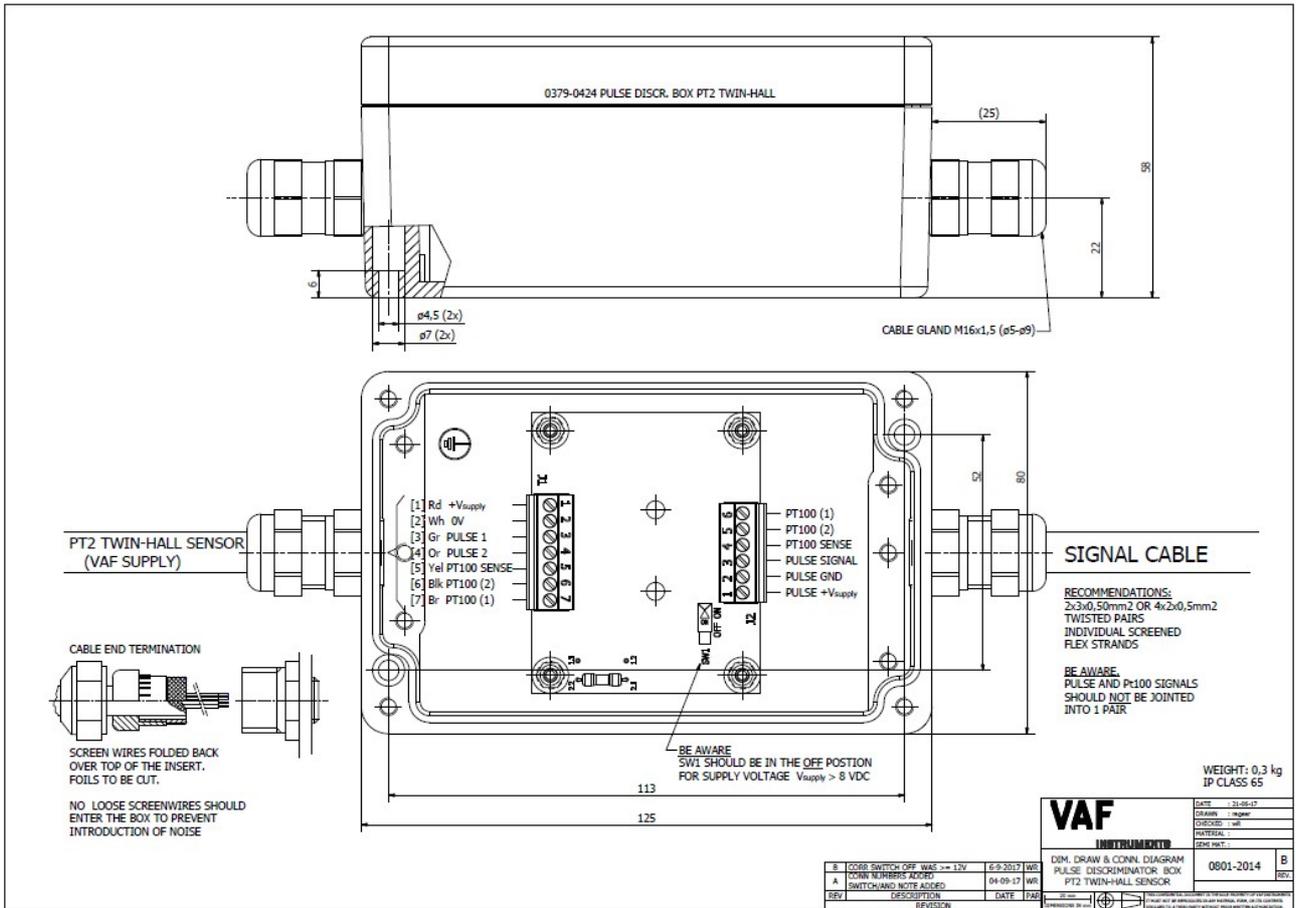


Figure 40 – Connection diagram of PT2Twin flowmeter

18. ABBREVIATIONS

PT100	Temperature sensor
PED	Pressure Equipment Directive

19. SPARE PARTS

<i>Model number</i>	<i>Spare kit for Flowmeter (magnets in vanes)^{*)}</i>	<i>Spare kit for Flowmeter (magnets in rotor)^{*)}</i>	<i>Spare kit for pulse transmitter</i>	<i>Spare kit for Twin-pulse transmitter</i>
J5015PT2	NA	0390-1356	0390-1274	-
J5023PT2	NA	0390-1356	0390-1274	-
J5025PT2	0390-1220	0390-1376	0390-1274	0390-1452
J5040PT2	0390-1220	0390-1376	0390-1274	0390-1452
J5050PT2	0390-1221	0390-1377	0390-1274	0390-1452

^{*)} **J5025/40/50PT2 are delivered with magnets in vanes before August 2014, and are delivered with magnets in rotor after August 2014. In case of doubt please contact VAF Instruments.**

Notes:

Spare parts kit for Flowmeter consists of 4 vanes, 2 vane rods and 2 o-rings.

Spare parts kit for pulse transmitter consists of Hall-sensor (PT2 or PT2Twin), o-ring, bolts and lockwashers.

20. WARRANTY CONDITIONS

1. Without prejudice to the restrictions stated hereinafter, the contractor guarantees both the soundness of the product delivered by him and the quality of the material used and/or delivered for it, insofar as this concerns faults in the product delivered which do not become apparent during inspection or transfer test, which the principal shall demonstrate to have arisen within 12 months from delivery in accordance with sub article 1A exclusively or predominantly as a direct consequence of unsoundness of the construction used by the contractor or as a consequence of faulty finishing or the use of poor materials.
 - 1A. The product shall be deemed to have been delivered when it is ready for inspection (if inspection at the premises of the contractor has been agreed) and otherwise when it is ready for shipment.
2. Articles 1 and 1a shall equally apply to faults which do not become apparent during inspection or transfer test which are caused exclusively or predominantly by unsound assembly/installation by the contractor. If assembly/installation is carried out by the contractor, the guarantee period intended in article 1 shall last 12 months from the day on which assembly/installation is completed by the contractor, with the understanding that in this case the guarantee period shall end not later than 18 months after delivery in accordance with the terms of subarticle 1A.
3. Defects covered by the guarantee intended under articles 1, 1a and 2 shall be remedied by the contractor by repair or replacement of the faulty component either on or off the premises of the contractor, or by shipment of a replacement component, this remaining at the discretion of the contractor. Sub article 3A shall equally apply if repair or replacement takes place at the site where the product has been assembled/installed. All costs accruing above the single obligation described in the first sentence, such as are not restricted to shipment costs, travelling and accommodation costs or disassembly or assembly costs insofar as they are not covered by the agreement, shall be paid by the principal.
 - 3A. If repair or replacement takes place at the site where the product has been assembled/installed, the principal shall ensure, at his own expense and risk, that:
 - a. the employees of the contractor shall be able to commence their work as soon as they have arrived at the erection site and continue to do so during normal working hours, and moreover, if the contractor deems it necessary, outside the normal working hours, with the proviso that the contractor informs the principal of this in good time;
 - b. suitable accommodation and/or all facilities required in accordance with government regulations, the agreement and common usage, shall be available for the employees of the contractor;
 - c. the access roads to the erection site shall be suitable for the transport required;
 - d. the allocated site shall be suitable for storage and assembly;
 - e. the necessary lockable storage sites for materials, tools and other goods shall be available;
 - f. the necessary and usual auxiliary workmen, auxiliary machines, auxiliary tools, materials and working materials (including process liquids, oils and greases, cleaning and other minor materials, gas, water, electricity, steam, compressed air, heating, lighting, etc.) and the measurement and testing equipment usual for in the business operations of the principal, shall be available at the correct place and at the disposal of the contractor at the correct time and without charge;

- g. all necessary safety and precautionary measures shall have been taken and adhered to, and all measures shall have been taken and adhered to necessary to observe the applicable government regulations in the context of assembly/installation;
 - h. the products shipped shall be available at the correct site at the commencement of and during assembly.
- 4. Defects not covered by the guarantee are those which occur partially or wholly as a result of:
 - A. non-observance of the operation and maintenance instructions or other than foreseeable normal usage;
 - B. normal wear and tear;
 - C. assembly/installation by third parties, including the principal;
 - D. the application of any government regulation regarding the nature or quality of the material used;
 - E. materials or goods used in consultation with the principal;
 - F. materials or goods provided by the principal to the contractor for processing;
 - G. materials, goods, working methods and constructions insofar as are applied at the express instruction of the principal, and materials or goods supplied by or on behalf of the principal.
 - H. components obtained from third parties by the contractor insofar as that party has given no guarantee to the contractor.
- 5. If the principal fails to fulfil any obligation properly or on time ensuing from the agreement concluded between the principal and the contractor or any agreement connected to it, the contractor shall not be bound by any of these agreements to any guarantee regardless of how it is referred to. If, without previous written approval from the contractor, the principal commences disassembly, repair or other work on the product or allows it to be commenced, then every agreement with regard to guarantee shall be void
- 6. Claims regarding defects must be submitted in writing as quickly as possible and not later than 14 days after the discovery of such. All claims against the contractor regarding faults shall be void if this term is exceeded. Claims pertaining to the guarantee must be submitted within one year of the valid complaint on penalty of invalidity.
- 7. If the contractor replaces components/products under the terms of his guarantee obligations, the replaced components/products shall become the property of the contractor.
- 8. Unless otherwise agreed, a guarantee on repair or overhaul work carried out by the contractor or other services shall only be given on the correctness of the manner in which the commissioned work is carried out, this for a period of 6 months. This guarantee only covers the single obligation of the contractor to carry out the work concerned once again in the event of unsound work. In this case, sub article 3A shall apply equally.
- 9. No guarantee shall be given regarded the inspection conducted, advice given and similar matters.
- 10. Alleged failure to comply with his guarantee commitments on the part of the contractor shall not absolve the principal from his obligations ensuing from any agreement concluded with the contractor.
- 11. No guarantee shall be given on products which form a part of, or on work and services on, goods older than 8 years.

Revision 0809: Chapter 6.5: Even designation / specification of wiring

Revision 0610: Chapter 17: Spare parts drawings numbers revised: 0801-2327, 0801-2328, 0801-2329

Revision 0111: Chapter 17: Drawings 0801-3202 and 0801-3203 corrected.

Revision 0211: Chapter 6.5 and 6.5.1: Text about connection of shielding corrected.

Revision 0711: House style change, text altered due to new calibration fluid.

Revision 0811: Installation requirements elucidated.

Revision 0112: Chapter 3.2.1: Technical details transmitter revised.

Revision 0212: Chapter 6.5.1 and 17: Drawing 0801-2007 revised.

Revision 1012: Figure 3 clarified.

Revision 0213: Chapter 6.5: Twisted for wires added in text.

Revision 0513: Chapter 6.3.1: Text filter description updated.

Revision 1113: Bearings change, Chapter 17: drawings adjusted.

Revision 1213: Additional clarifications pulse output.

Revision 0314: Chapter 17: Spare parts names changed.

Revision 0514: J5015PT2 (½") and J5023PT2 (1") intergraded into the manual.

Revision 0914: Magnets in rotor added.

Revision 1114: 4 pc magnets changed to 2 or 4 on p.17.

Revision 0715: Sensor supply on drawing to 12- 24 VDC, J5015/23PT2 80 p/l added.
Chapter 17: Drawing 0801-2007 adjusted

Revision 1116: Chapter 1.1: Warning added. Chapter 3.2.2: J5015PT2 and J5023PT2 160 p/l deleted.

Revision 0317: Chapter 8.2: Adjusted.

Revision 0517: Chapter 9.1: Information added.

Revision 1117: Chapter 1.1, 2, 3.2.1, 3.3, 3.3.1, 3.4, 6.5, 6.5.1, 17, 19: PT2Twin information added.



VAF

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