OPERATING MANUEL

Model : EFS

FLOW SWITCH

Information in this manual is reviewed and completely reliable. Responsibility is not assumed due to any typing error.
Products in this manual are available only for information purpose and they may be changed without notice.



Models :

EFS 05s / 05sx / 05p / 05px
EFS 06s / 06sx / 06p / 06px
EFS 08s/10s/15s/20s/25s/32s/40s/50s
EFS 15p/20p/25p/32p/40p/50p
EFS 15px / 15bx
EFS 20cx/25cx/32cx/40cx/50cx
EFS 20sx/25sx/32sx/40sx/50sx

CE EAC

Important Notes:

Used Symbols :

: Caution : Note : Disposal

- Please read this manual carefully before installation of the **level switch**. User is responsible for accidents and losses arising from failure to comply with the warnings in this manual.
- In the event that **level switch** is broken, take measures in order to prevent accidents and losses which can occur in its system.
- There is not any fuse and circuit breaker on the instrument; they should have been added to the system by the user.
- This manual should be stored in an easily accessible place for subsequent use.
- The manufacturer's liability cannot exceed the purchase price of the device according to the law.
- Do not make any modification on the instrument and do not try to repair it. Reparation should be made by authorized service staff.
- Do not operate the system before making assembly in compliance with the assembly chart related to the instrument.
- Products which do not contain label and serial number are considered to be excluded from the warranty scope.
- The instrument's useful life, determined and announced by the ministry, is 10 years.

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1. General Information :

1.1. Material Acceptance

Check that there is no damage on the packages during the transportation immediately after the material acceptance. If packages are damaged, open the packages immediately and check whether products are affected or not, if there is any damage, send your complaint report to the transporter company and its photocopy to the address of our company.

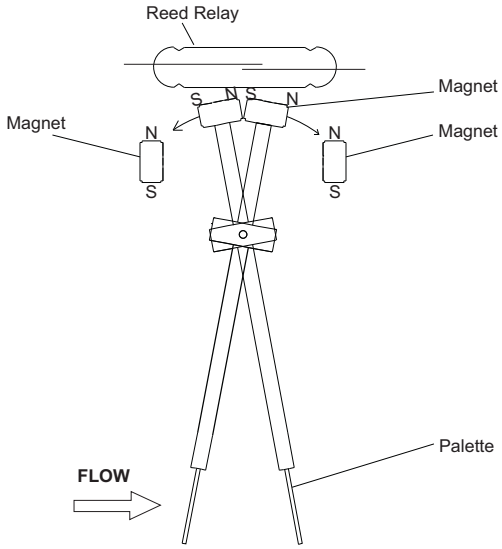
1.2. Information about Areas of Use

EFS is used in order to check safely whether there is flow or not by detecting movement of liquids inside the pipe. It provides information about flow with high reliability without spending energy in cooling water or lubricating oil circuits, in the devices such as flash heater, central heating boiler and heater.
It should be assembled vertically.
It should be used in allowed using medium and application areas!
It is not used in the corrosive mediums, ambient with explosive and flammable material.
Conformity with medium to be measured should be also taken into consideration.
Responsibility is not assumed in case of inappropriate use, modification and injure,
and such cases are not covered by warranty.

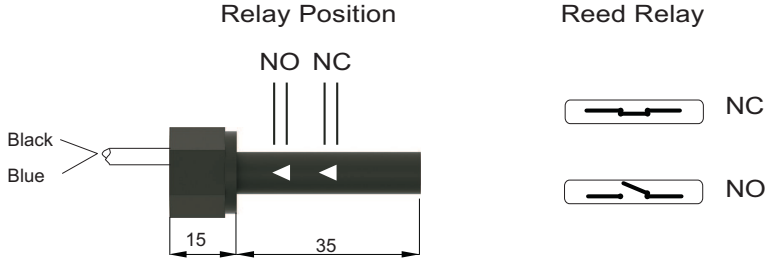
Ambient Conditions: Relative Humidity: 5-95 %RH Ambient temperature: 70C (It is not used under -5 C)

1.3. Operating Princible

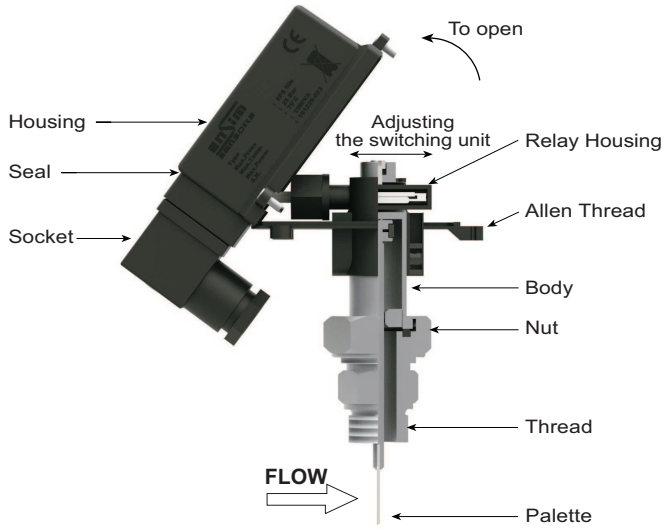
Palette, fastened from one point on the body, moves contact with fluid so that information about flow is obtained.
When flow stops, it is provided that paddle comes to first position by pushing magnet with reverse pole in the paddle, attached on the body. By this means, longer life and resistance to higher pressure is provided in comparison with those of spring mechanisms. Reed relay with high precision and long life is used.

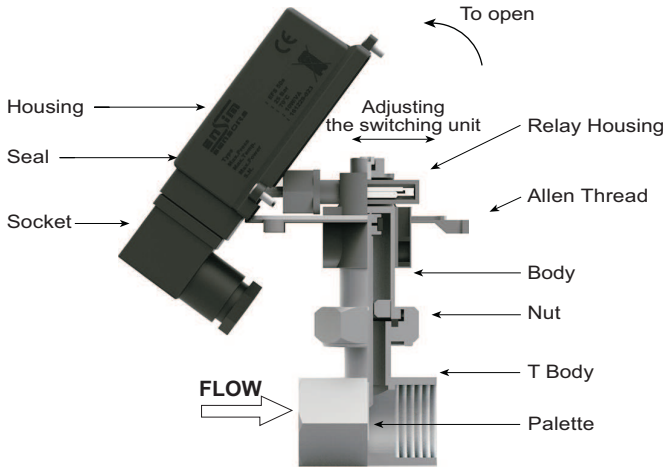


Relay Position Settings:



1.4. Technical Specifications and Material





Technical Specifications :

MODEL		Stainless Type (EFS ..s)	Plastic Type (EFS ..p)
MATERIAL	Body+Thread+Nut	AISI 304 St.St. (Opt. AISI 316 St.St.)	Polypropylene
	T Body	AISI 304 St.St. (Opt. AISI 316 St.St.)	Polypropylene
	Bolt	AISI 316 Stainless Steel	Polypropylene
	Palette	AISI 316 Stainless Steel	Polypropylene
	Relay Case	Polypropylene	Polypropylene
	Magnet Case	Polypropylene	Polypropylene
	O-Ring	FPM	NBR
FLUID		Water (Oil, gas and aggresive media on request)	Water (Oil, gas and aggresive media on request)
TOLERANCE		+/- %15 of full scale value	+/- %15 of full scale value
MAX. WORKING PRESSURE		25 bar	10 bar
WORKING TEMPERATURE		(-) 20 °C / (+) 110 °C	(-) 20 °C / (+) 70 °C
AMBIED TEMPERATURE		(-) 20 °C / (+) 70 °C	(-) 20 °C / (+) 70 °C
CONTACT		Reed Switch SPST - NO	Reed Switch SPST - NO
* CONTACT CURRENT		1 A	1 A
* MAX. CONTACT POWER		10 W / VA	10 W / VA
* MAX. SWITHCHING VOLTAGE		200 VDC / 140 VAC	200 VDC / 140 VAC
ELECTRICAL CONNECTIONS		ISO 4400 socket Opt.Cable Output, Socket with LED	ISO 4400 socket Opt.Cable Output, Socket with LED
PROTECTION CLASS		IP 65, IP 67 (for sx, cx type)	IP 65, IP 67 (for px, bx type)

* WARNINGS!

Please pay attention to following matters in order to operate your flow switch properly.

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads.

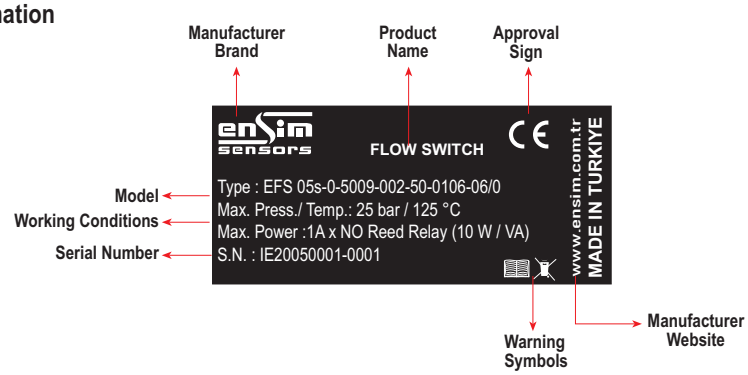
(Capacitive or inductive loads must be operated using a protective circuit.)

1.5. Target Group
This operating manual has been prepared for qualified technical personnel.

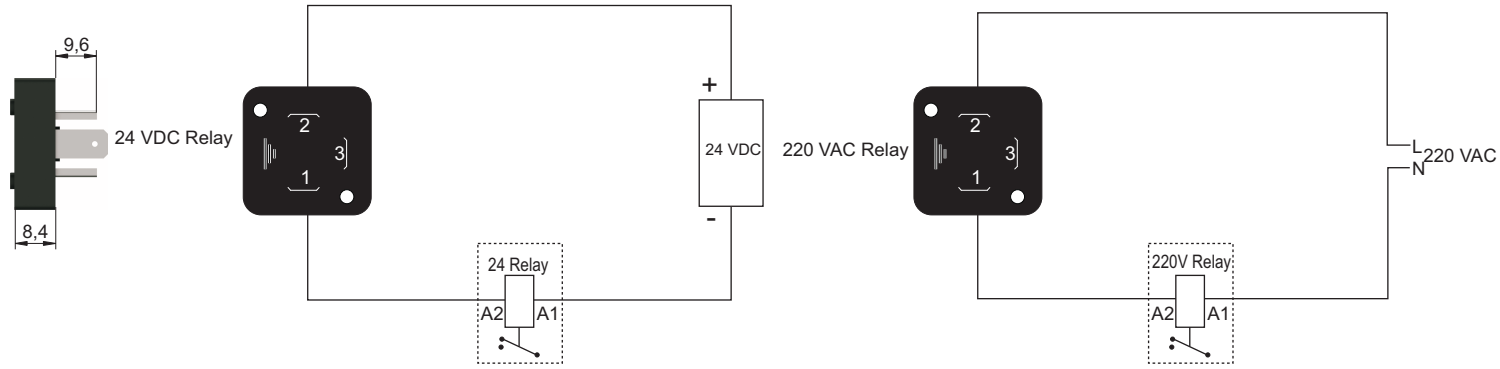
1.6. Security Notes
Following notes should be taken into consideration in order to avoid dangers which can occur on the operator and around the ambient: Installation, operation and maintenance of this instrument should be made only by people who have read the operating manual and who are knowledgeable about work safety!
It should be complied with work safety, accident prevention regulations and national installation standards.
Product should be used only within the scope of stated specifications!
You can assemble the instrument only when pressure is not available!

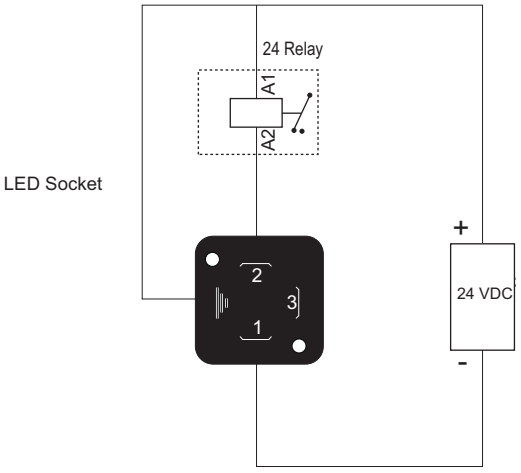
1.7. Content of Package
Please check whether you have taken delivery of below listed content completely or not and check its conformity with criterions in your order:
* Flow switch
*This operating manual

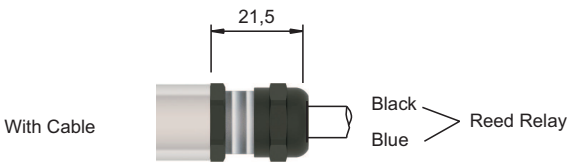
1.8. Label Information



1.9. Electrical Installation
Make the electrical connection of the instrument according to details on its label, table and cable figures in this manual.







2. Installation

2.1. General Notes

Installation of the instrument should be made only by authorized personnel.
Do not apply force to the instrument during the installation!
Do not use the level indicator with a greater pressure than recommended pressure.
Do not forget that instrument is precise, carry it carefully and prevent to be damaged.
It should be guaranteed that there are not any magnetic particles.

2.2. General Installation Stages

*Remove level indicator from the box carefully
*Check whether gasket is appropriate for fluid or not. If is not appropriate, contact with the producer.
*Then, apply below mentioned explanations according to structure of the design.

2.3. Special Notes

*Please ensure that there is no mechanical stress on the shaft following installation.
Such case will cause slipping in thecharacteristic curve.
*Flow switch should be placed in completely vertical position on the line.
*Allocate valve certainly in the process connection while instrument is used.
*Allocate blowdown valve under bottom flange for blowdown.
*If instrument is mounted outside and if there is any danger of lightning or
excessive pressure, take preventive measures by taking necessary measures.
*In the operating conditions, level indicator may be hot according
to situation of fluid, in this case, do not touch the indicator, otherwise your
skin is damaged.

2.4. Installation For Mechanical Connections

*Use appropriate O-Ring or gasket for tightness.
*Ensure that its surface is clean and smooth.
*Assemble the instrument manually.
*Attach float valve in such a manner that arrow will come up.
*Tighten the bolts as shown in the key figure. (Max. 20 Nm)

Installation For T-Type

•Make sure the device is mounted on the pipe vertical.
•Assemble the instrument manually.
•Tighten the bolts as shown in the key figure. (G1/2"and G3/4" for max. 20 Nm)

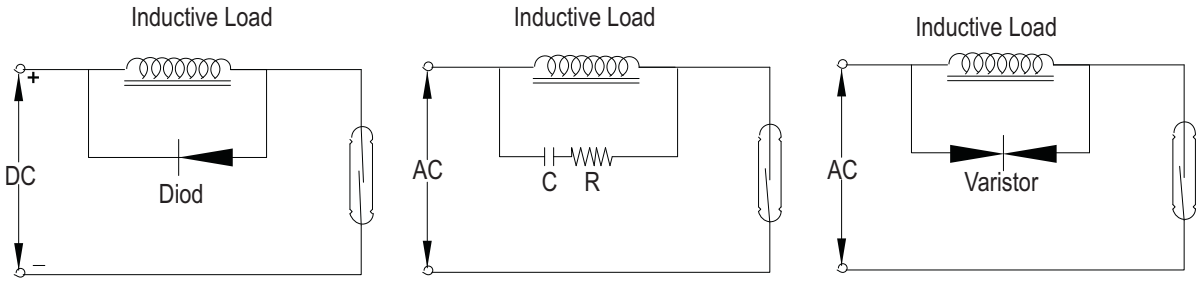
Installation For Plastic Type

•Make sure the device is mounted on the pipe vertical.
•Assemble the instrument manually.
•Tighten the bolts as shown in the key figure. (Max. 10 Nm)

2.5 . Reed Relay and Protection Circuit

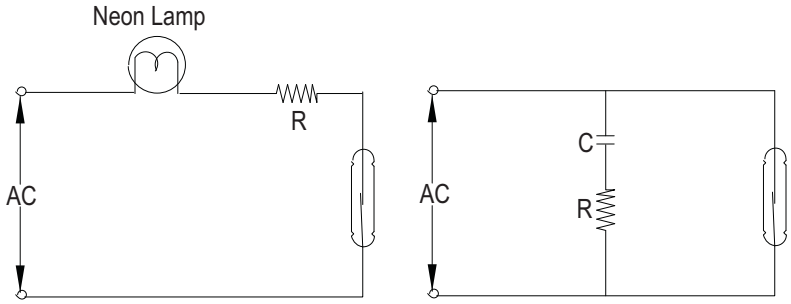
Inductive Load

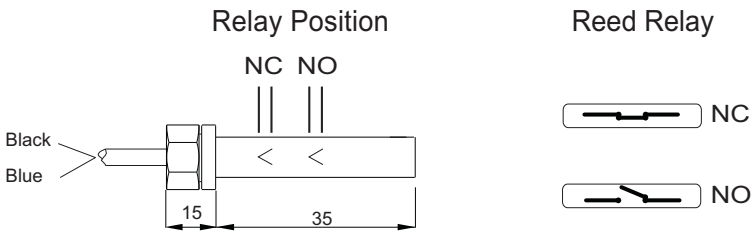
When reed switch is used for loads such as electromagnetic relay ,contactor or solenoid, reed switch may be exposed to very high voltage depending on value of inductive load. This causes either failure of switch or shortening its service life. Therefore, it is recommended to be used as follows depending on used voltage, for the purpose of protection of switch.



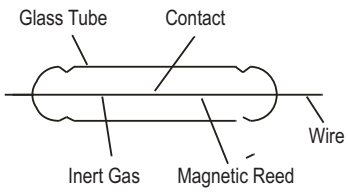
Capacitive Load

When reed switch is used with capacitive load, it may cause that high current passes over reed switch, depending on value of capacity during Charge –'96 Discharge of capacity. So this may cause failure of switch. It is recommended to be used as follows depending on used voltage, for the purpose of protection of switch.

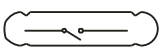




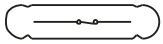
When there is flow, factory settings of the flow switch is normally closed.
When flow stopped, contact is open.



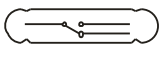
SPST-NO
Single Pole-Single Throw
Normally Open



SPST-NC
Single Pole-Single Throw
Normally Closed

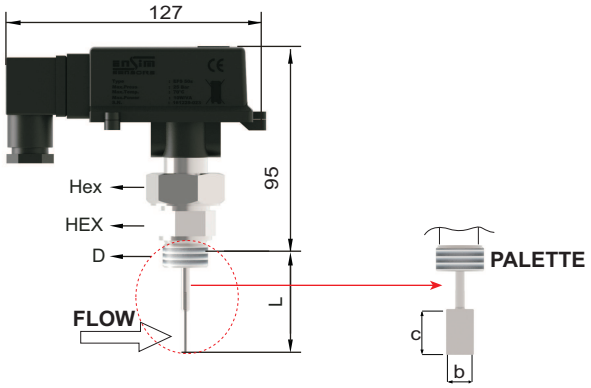


SPDT-NO/NC
Single Pole-Double Throw
Open / Closed Contact



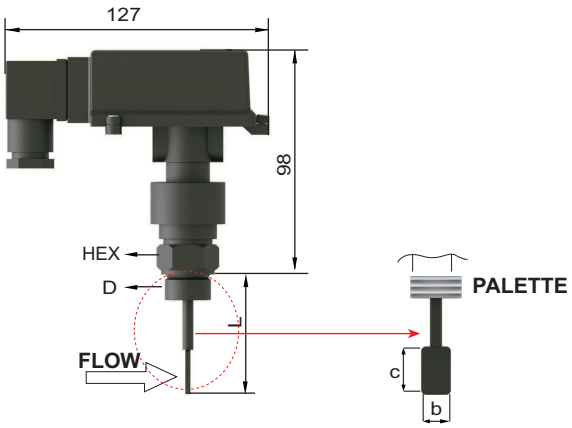
2.6. Dimensions and Working Ranges :

EFS 05s , EFS 06s



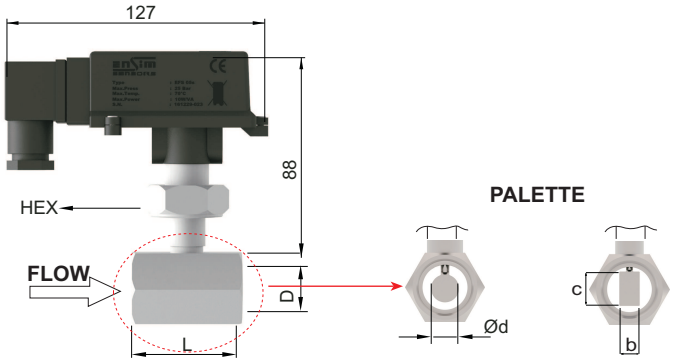
MODEL	Pipe Size	Connection Size D	Max. Flow (m³ / h) Water	Rising Flow Rate (m³ / h) Water	Falling Flow Rate (m³ / h) Water	hex-HEX (mm)	L (mm)	Palette b-c (mm)
EFS 05s	DN 50	1/2 " BSP	28	1,5 / 2,5	1,4 / 2,2	32/ 27	50	12 x 20
	DN 80	1/2 " BSP	75	4 / 7,5	3,8 / 7	32/ 27	50	12 x 20
	DN 100	1/2 " BSP	140	6 / 10,5	5,5 / 10	32/ 27	50	12 x 20
EFS 06s	DN 100	1/2 " BSP	100	5,5 / 6,1	5,3 / 6	32/ 27	110	12 x 80
	DN 150	1/2 " BSP	140	9,5 / 12,5	9 / 12	32/ 27	110	12 x 80
	DN 200	1/2 " BSP	200	22,5 / 26	22 / 25	32/ 27	110	12 x 80

EFS 05p , EFS 06p



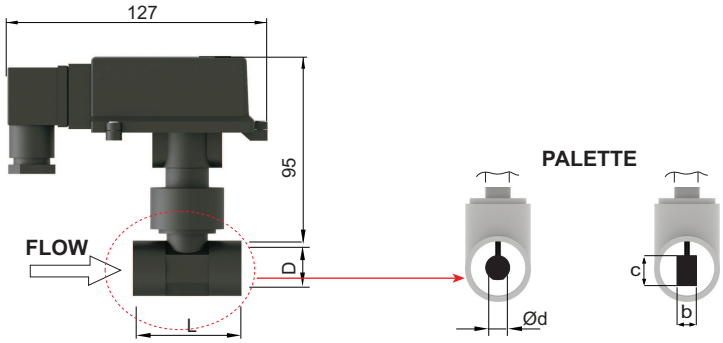
MODEL	Pipe Size	Connection Size D	Max. Flow (m³ / h) Water	Rising Flow Rate (m³ / h) Water	Falling Flow Rate (m³ / h) Water	HEX (mm)	L (mm)	Palette b-c (mm)
EFS 05p	DN 50	1/2 " BSP	20	1/ 2	0,9 / 1,9	27	52	12 x 20
	DN 80	1/2 " BSP	30	3/ 6	2,9 / 5,5	27	52	12 x 20
	DN 100	1/2 " BSP	40	4,8 /8	4,6 / 7,5	27	52	12 x 20
EFS 06p	DN 100	1/2 " BSP	70	4,5 / 5,5	4 / 5	27	112	12 x 80
	DN 150	1/2 " BSP	110	8 / 11	7,8 / 10	27	112	12 x 80
	DN 200	1/2 " BSP	120	18 / 24,2	17,5 / 24	27	112	12 x 80

EFS 08s , EFS 10s
EFS 15s , EFS 20s
EFS 25s , EFS 32s
EFS 40s , EFS 50s



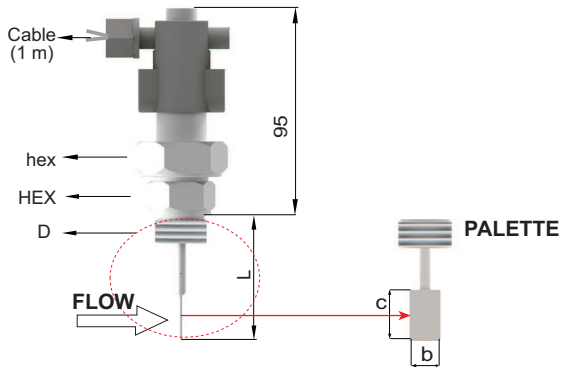
MODEL	Pipe Size	Connection Size D	Max. Flow (L / min) Water	Rising Flow Rate (L / min) Water	Falling Flow Rate (L / min) Water	hex (mm)	L (mm)	Palette d Ø b-c (mm)
EFS 08s	DN 8	1/4 ” BSP	40	2 / 3	1,8 / 2,8	32	50	Ø 10
EFS 10s	DN 10	3/8 ” BSP	50	2,7	2,4	32	50	Ø 10
EFS 15s	DN 15	1/2 ” BSP	60	3,1	2,5	32	50	Ø 10
EFS 20s	DN 20	3/4 ” BSP	80	5.7	4,7	32	50	Ø 13
EFS 25s	DN 25	1 ” BSP	150	12 /15	11,6 /14,8	32	50	12 x 20
EFS 32s	DN 32	1 1/4 ” BSP	200	16 / 19,5	15,7 / 19,1	32	50	12 x 20
EFS 40s	DN 40	1 1/2 ” BSP	300	24,2 / 38	24 / 37,5	32	50	12 x 20
EFS 50s	DN 50	2 ” BSP	300	35 / 48	34 / 47	32	65	12 x 20

EFS 15p , EFS 20p
EFS 25p , EFS 32p
EFS 40p , EFS 50p



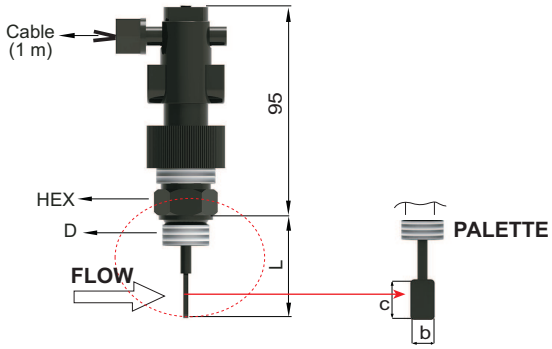
MODEL	Pipe Size	Connection Size D	Max. Flow (L / min) Water	Rising Flow Rate (L / min) Water	Falling Flow Rate (L / min) Water	L (mm)	Palette d Ø b-c (mm)
EFS 15p	DN 15	1/2 ” BSP	30	5,5	5,3	50	Ø 9
EFS 20p	DN 20	3/4 ” BSP	80	11,7	10,5	50	Ø 13
EFS 25p	DN 25	1 ” BSP	100	14	13	50	12 x 20
EFS 32p	DN 32	1 1/4 ” BSP	140	21	20,5	50	12 x 20
EFS 40p	DN 40	1 1/2 ” BSP	180	26,5	35,8	50	12 x 20
EFS 50p	DN 50	2 ” BSP	250	38,4	42,3	65	12 x 20

EFS 05sx , EFS 06sx

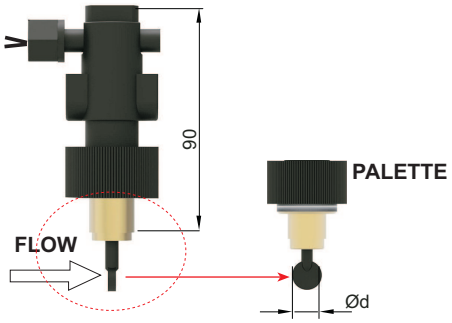


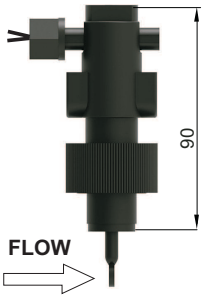
MODEL	Pipe Size	Connection Size D	Max. Flow (m³ / h) Water	Rising Flow Rate (m³ / h) Water	Falling Flow Rate (m³ / h) Water	hex-HEX (mm)	L (mm)	Palette b-c (mm)
EFS 05sx	DN 50	1/2 ” BSP	28	1,5 / 2,5	1,4 / 2,2	32/ 27	50	12 x 20
	DN 80	1/2 ” BSP	75	4 / 7,5	3,8 / 7	32/ 27	50	12 x 20
	DN 100	1/2 ” BSP	140	6 / 10,5	5,5 / 10	32/ 27	50	12 x 20
EFS 06sx	DN 100	1/2 ” BSP	100	5,5 / 6,1	5,3 / 6	32/ 27	110	12 x 80
	DN 150	1/2 ” BSP	140	9,5 / 12,5	9 / 12	32/ 27	110	12 x 80
	DN 200	1/2 ” BSP	200	22,5 / 26	22 / 25	32/ 27	110	12 x 80

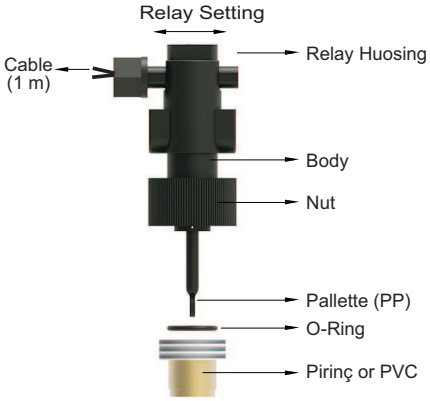
EFS 05px , EFS 06px



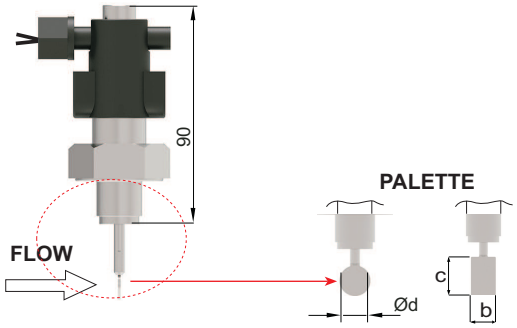
MODEL	Pipe Size	Connection Size D	Max. Flow (m³ / h) Water	Rising Flow Rate (m³ / h) Water	Falling Flow Rate (m³ / h) Water	HEX (mm)	L (mm)	Palette b-c (mm)
EFS 05px	DN 50	1/2” BSP	20	1/ 2	0,9 / 1,9	27	52	12 x 20
	DN 80	1/2” BSP	30	3/ 6	2,9 / 5,5	27	52	12 x 20
	DN 100	1/2” BSP	40	4,8 /8	4,6 / 7,5	27	52	12 x 20
EFS 06px	DN 100	1/2” BSP	70	4,5 / 5,5	4 / 5	27	112	12 x 80
	DN 150	1/2” BSP	110	8 / 11	7,8 / 10	27	112	12 x 80
	DN 200	1/2” BSP	120	18 / 24,2	17,5 / 24	27	112	12 x 80

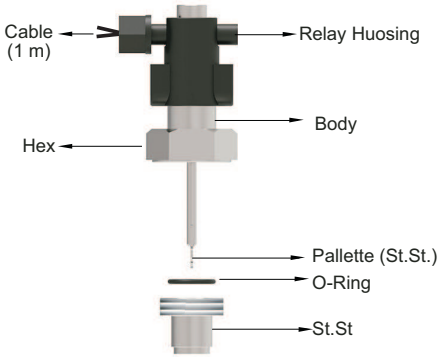






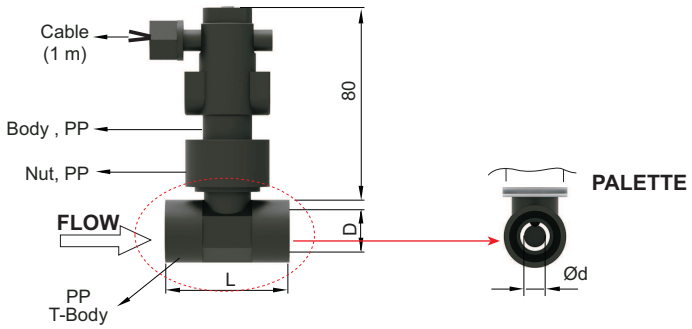
	MODEL	Pipe Size	Max. Flow (L / min) Water	Rising Flow Rate (L / min) Water	Falling Flow Rate (L / min) Water	Palette d Ø b-c (mm)
EFS 20cx	EFS 20cx	DN 20	80	5,5	5,3	Ø 9
EFS 25cx	EFS 25cx	DN 25	125	11,7	10,5	Ø 13
EFS 32cx	EFS 32cx	DN 32	150	14	13	12 x 20
EFS 40cx	EFS 40cx	DN 40	225	21	20,5	12 x 20
EFS 50cx	EFS 50cx	DN 50	300	26,5	35,8	12 x 20





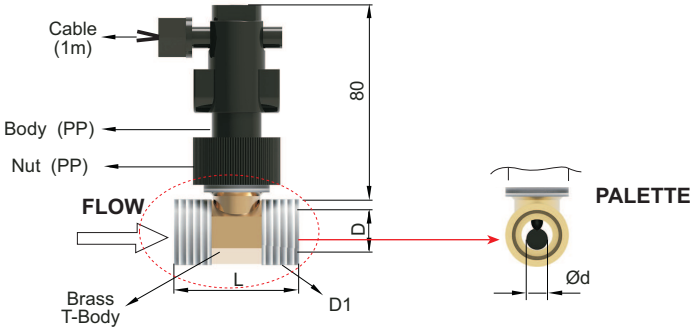
	MODEL	Pipe Size	Max. Flow (L / min) Water	Rising Flow Rate (L / min) Water	Falling Flow Rate (L / min) Water	HEX (mm)	Palette d Ø b-c (mm)
EFS 20sx	EFS 20sx	DN 20	80	5,5	5,3	27	Ø 9
EFS 25sx	EFS 25sx	DN 25	125	11,7	10,5	32	Ø 13
EFS 32sx	EFS 32sx	DN 32	150	14	13	41	12 x 20
EFS 40sx	EFS 40sx	DN 40	225	21	20,5	50	12 x 20
EFS 50sx	EFS 50sx	DN 50	300	26,5	35,8	60	12 x 20

EFS 15px



MODEL	Pipe Size	Connection Size D / D1	Max Flow (m^3 / h) Water	Rising Flow Rate (L / min) Water	Falling Flow Rate (L / min) Water	L (mm)	Palette d Ø (mm)
EFS 15px	DN 15	1/2" / * BSP	40	2...4,5	1,5...4	50	Ø 9
EFS 15bx	DN 15	1/2" BSP / 3/4" BSP	40	2...5,3	1.5...5,1	53	Ø 9

EFS 15bx



2.7. Order Form

Order Form : Please consider sample models when coding

1 MODEL

EFS 05s	EFS 06s	EFS 08s	EFS 15p	EFS 15px	EFS 20cx	EFS 20sx
EFS 05sx	EFS 06sx	EFS 10s	EFS 20p	EFS 15bx	EFS 25cx	EFS 25sx
EFS 05p	EFS 06p	EFS 15s	EFS 25p		EFS 32cx	EFS 32sx
EFS 05px	EFS 06px	EFS 20s	EFS 32p		EFS 40cx	EFS 40sx
		EFS 25s	EFS 40p		EFS 50cx	EFS 50sx
		EFS 32s	EFS 50p			
		EFS 40s				
		EFS 50s				

2 CERTIFICATE

None.....0

(EN10204-3-1) Material Certification.....1

3 HOUSING

None.....0

Plastic Housing , B05p 002

Aluminium Housing , B22x.....750

Special.....x

4 CONNECTION MATERIAL

304 Stainless Steel.....001

316 Stainless Steel.....002

PVC.....061

Special.....x

5 ELECTRICAL CONNECTION

Terminal (For Housing Models).....00

Polyamide Big Socket P01.....50

Polyamide Big Socket With Light P03.....52

Special Cable.....x

Special socket.....x

M12-2 Pin.....70

M12-5 Pin.....71

PVC Cable (Max.60 °C).....80

PVC Cable (Max.105 °C).....81

6 CONNECTION

Thread 1/4 " BSP Female.....0101

Thread 3/8 " BSP Female.....0102

Thread 1/2 " BSP Female.....0103

Thread 3/4 " BSP Female.....0104

Thread 1 " BSP Female.....0105

Thread 1 1/4 " BSP Female.....0106

Thread 1 1/2 " BSP Female.....0107

Thread 2 " BSP Female.....0108

Thread 1/2 " BSP Male Thread.....0004

Thread 3/4 " BSP Male Thread.....0005

Thread 1" BSP Male Thread.....0006

Apparatus - Brass (For Soldering).....x001

Apparatus - Stainless Steel (For Welding).....x002

Special.....x

8 CONTACT STRUCTURE

NO Reed Relay (Std.) 06

NC Reed Relay.....07

NO / NC Reed Relay.....08

Special.....x

9 OPTIONAL

None...../ 0

Special.....x

EXAMPLE

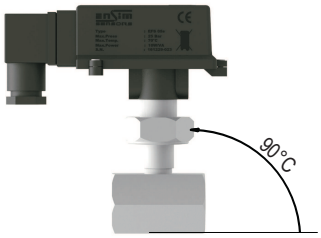
EFS 05s-0-002-002-50-0106-06/0

EFS 05s Flow Switch , 316 Stainless Steel , 1/2 " BSP Male Thread , NO Contact

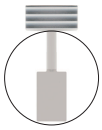
WARNING !!!

2.8.

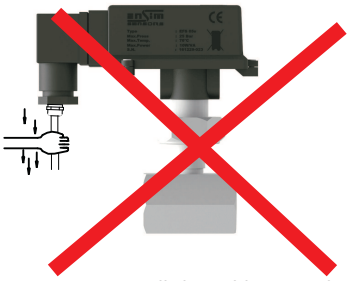
Please pay attention to following matters in order to operate your flow switch properly.



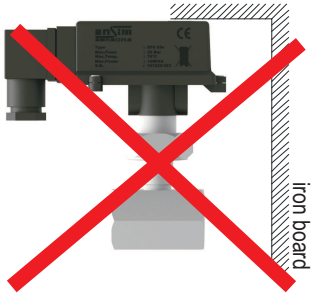
Please do not mount slant way, otherwise switch do not work correctly.



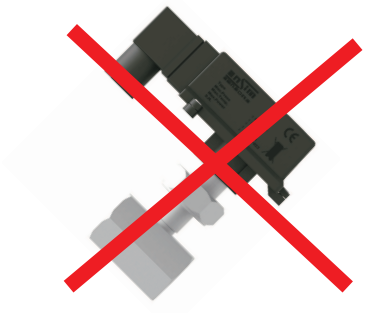
It should be placed in such a manner that middle point of palette will come into pipe axis.



Do not pull the cable strongly, otherwise the characteristics might be changed.



Please keep away from magnetic materials like iron board ; otherwise the characteristics might be affected



Please do not drop , otherwise the characteristics might be changed.



Please do not dip cables potting into liquids,otherwise instulation problem may cause.



Do not fasten switch reversely , otherwise its characteristics might be changed.



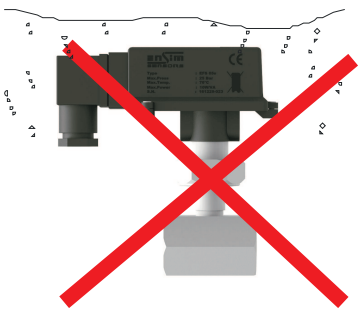
Vibration might be caused instability.



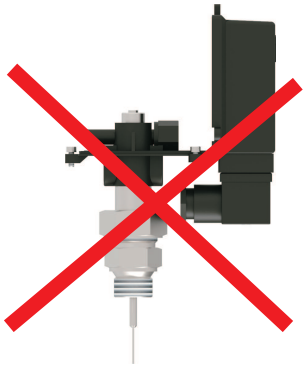
Please avoid using with liquids which damage materials of parts , otherwise quality can not be maintained accurately.



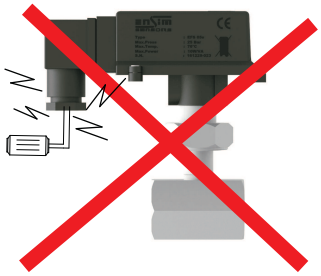
Do not fasten switch reversely , otherwise its characteristics might be changed.



In case vapour splash cable potting points,insulation problem may cause.



Do not remove the plastic parts of the bottom of the switch body , do not loosen.



Excess current , to be drawn as a result of direct connection to motor, may burn relay of switch

3. Failure Delection

Breakdown	Probable cause	Failure detection\correction
Pedal was broken or bent	- The product was not used in compatible with fluid flow. - The product was not used in compatible with fluid pressure.	-Check the flow range and use in compatible paller with the flow. -Select a model in compatible with the pressure.
It does not contact or it contacts continuously	-Contact adjusting bar shifted. - It was not connected with connection angle of 90 (vertical). - Socket and/or cable may be damaged. - Product was exposed to magnetic field in the ambient. - It was applied to the higher values than application current and/or voltage. - Magnet may be damaged.	-Adjust the sensitivity setting rod. -Upright the connection position. -Check for socket connections and cable damage. -The factor which constitutes the magnetic field should be removed or insulated. -Inform the authorized service.
Pedal does not come back, it remains attached.	-Sedimentary and/or sticky fluid jammed the pedal. - Pedal magnet was damaged as a result of taking a blow after product fell.	-Use filter in the line to prevent dirtiness. -Inform the authorized service.
Pedal melted	-It was used in the higher heat than the application heating value. - The product was not selected in compatible with nature of chemical flow.	-Select a model in compatible with the temperature. -Select a resistant model in compatible with the chemical fluid.
Housing was broken	- Tightening the screws more than adequate during the assembly. - Product falling or taking a blow from outside.	-Inform the authorized service.
Contact operates unsteadily	- Exposing the product to the magnetic field in the ambient. - Exposing the product to the vibration.	-The factor which constitutes the magnetic field should be removed or insulated. -Vibration should be prevented in order to affect the product or it should be connected to a place where vibration will not occur. The factor which constitutes the magnetic field should be removed or insulated.

If you find an error, try to eliminate it by using this table or send the instrument to our service address for repair.



The instrument should be repaired only by authorized service!

4. Disassembly of Instrument

Instrument should be disassembled while feeding and pressure is not available!

5. Service

The instrument does not require maintenance. If it is desired, residue accumulated inside should be blown according to kind of fluid and instrument can be cleaned with soft cleaning solutions. Measures should be taken during the disassembly.

6. Recalibration

Calibration is not required during long period useful life of a level switch.

7. Repair –'96Manufacturer Address

If irreparable breakdowns occur, the instrument should be sent to us for repair purpose. Before this, the instrument should be cleaned carefully and packaged so as not to be broken. Furthermore, you should also add a detailed explanation which describes the breakdown while instrument is sent. If your instrument contacts with harmful substances, decontamination report should be also sent additionally. In the event that instrument does not have any decontamination report or our service department has doubts about instrument, repair process will not start until an acceptable report is sent.



If the instrument contacts with hazardous substances, necessary measures should be taken for decontamination!
Service -Manufacturer Company Name and Address:

LONCA MAK. SAN. TİC. A.Ş. Ferhatpaşa Mah. 37 Sok. No:78/A 34888 Ataşehir - İSTANBUL / TÜRKİYE
Phone : +90 216 50 50 555 / E-Mail: lonca@ensim.com.tr Web : www.ensim.com.tr

8. Disposal

The instrument should be disposed according to 2002/96/EC and 2003/108/EC European Directives (waste electrical and electronic instruments). Waste electrical and electronic equipment should not be mixed with domestic wastes!





If the instrument has contacted with harmful substances, special attention should be paid for its disposal!

9. Terms of Warranty

The instrument has warranty legally for 24 months after delivery date. Warranty demands are not accepted in case of inappropriate operation, damage on the instrument or any modification on the instrument.

10. Terms of Return

In the return of materials, user should send an open list related to damage or problem, malfunction of the material to be returned or its operation in the different modification, with the instrument. If it is required to return the material, used in the dangerous, corrosive or toxic fluid, in this case, used part should be cleaned very carefully. Security of personnel should be ensured. All products to be returned should be sent to our company address, which we have stated.