#### MOULDPRO®

# **02.** FLOW MEASUREMENT AND CONTROL









– 4.3" Touch screen

### Flosense; the new affordable, flexible flow monitoring system designed for accurate measuring and monitoring of flow, temperature and pressure variations in cooling circuits

Flosense is designed to be installed in various locations within the cooling circuit including the main water supply, the mould heater, critical cooling channels or distribution manifolds.

Quick to install and easy to set-up, Flosense is a critical component in any injection moulding configuration and should form part of any setup where cost control and quality are key considerations. Using these values, Flosense provides an indication of the stability of the process and checks the efficiency, identifying wasted energy and variations in pressure which could indicate leaks or blocked waterways.

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#### MOULDPRO<sup>®</sup>

# flosense



Pressure loss is caused by hoses, fittings and valves and will affect the productivity.

Difference between inlet pressure and return pressure is measured as Delta P.

Variation in Delta P could indicate pump failure, blocked waterway, leaks etc.



As the cooling water passes through the mould it transfers heat from the steel into the cooling water. The more turbulent the flow the more efficient this process of cooling.

Difference between inlet temperature and return temperature is measured as Delta T.

Sudden variation in Delta T may be caused by a faulty heater/ cooler, blocked channel, scale build up etc.



Flosense, provides visibility of key cooling circuit metrics, improves efficiency, enhances productivity and profitability.



#### Energy Transfer Indicator

Heat is transfered from the mould through the water channels, Flosense calculates the heat transfer as energy units BTU or kWh. This feature illustrates the effeciency of the process.



#### **Turbolent Flow Indicator**

Often regarded as a key indicator in the efficiency of a mould cooling circuit, Flosense is fitted with a turbulent flow indicator. The unit will indicate laminar, transitional and turbulent flow as well as monitoring the Reynolds number, based on flow diameter and percentage glycol in the system.

Improving the flow from laminar to turbulent can increase the heat transfer efficiency by up to 500%.



Flosense, provides features and interfaces to monitor, analyse and verify data, essential for your productivity and quality.



#### Alarm Output

With programmable alarm limits on flow, temperature and pressure any variation in the values being monitored will trigger an on-screen alarm. An external alarm output signal can be connected to auxiliary equipment which could be a visual or audible beacon, the mould heater or the injection moulding machine.

Even in a 'hose burst' situation the unit will identify a sudden loss of pressure and the unit can either be connected to an alarm or could be used to automatically shut down the mould heater.



#### DATA RECORDING

Data is recorded and stored in the internal memory enough to display data for the previous 30 days.

Flow, Temperature and Pressure are logged and may be viewed in the graphing screen.

The last 30 days of data is recorded and stored on the internal memory.



#### Data Export

It is also possible to download the data to a laptop using the integrated USB port for further analysis.

The data is stored as text file can can be analysed using excel or other analysing software.

#### SINGLE SENSOR KIT

PRESSURE PRESSURE FLOW				Flow, pressure and temp		2 x B		,
Part	No.	Flow capacity I/m	A	Connection B	C	Max Temp.	Pressure Range	

Part No.	Flow capacity I/m	A	Connection B	C	Max Temp.	Pressure Range
FS-115-K	2-20	110	G 3/4"	58,8	120°C	0-10 Bar
FS-240-K	4-40	110	G 3/4"	58,8	120°C	0-10 Bar
FS-5100-K	10-100	129	G 1"	66,5	120°C	0-10 Bar
FS-10200-K	20-200	137,5	G 1-1/4"	74,1	120°C	0-10 Bar

Description

Supplied as a Kit FloSense comes complete with Touch Screen, Magnetic Bracket, Power Supply, USB Cable, Multi-Sensor and Cables (1200 mm).

#### **DUAL SENSOR KIT**



	Part No.	Flow capacity I/m	A	Connection B	C	Max lemp.	Pressure Kange
	FS-115-10-K	2-20	110	G 3/4"	58,8	120°C	0-10 Bar
	FS-240-10-K	4-40	110	G 3/4"	58,8	120°C	0-10 Bar
	FS-5100-10-K	10-100	129	G 1"	66,5	120°C	0-10 Bar
	FS-10200-10-K	20-200	137,5	G 1-1/4"	74,1	120°C	0-10 Bar
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#### Description

Supplied as a Kit FloSense comes complete with Touch Screen, Magnetic Bracket, Power Supply, USB Cable, Multi-Sensor, Inlet Sensor and Cables (1200 mm).

#### **OPTIONAL (NOT INCLUDED IN THE KIT) AISI 316**



#### **TOUCH CONTROL**



#### **MULTI SENSOR KIT UNIT**





Part No.	Flow capacity I/m	Α	В	C	Max temperature	Hosetail Ref.
FS-115	2-20	110	G 3/4"	58,8	120°C	CFR3/4-13
FS-240	4-40	110	G 3/4"	58,8	120°C	HT-316-2 / CFR3/4-19
FS-5100	10-100	129	G 1"	66,5	120°C	CFR1-25 / CFR1-25
FS-10200	20-200	137,5	G 1-1/4"	74,1	120°C	HT-316-4 / CFR1.1/4-32

Description

Includes Flow Pipe and Multi Sensor (cable not included)

#### **PRESSURE & TEMPERATURE SENSOR**



#### **T-CONNECTOR**





Part No.	Pressure Range Bar	Thread	Max Temp.
PS-100-G1/2	0-10	1/2" BSPP	120°C

Part No.	D1	D2
T-316-1	1/2"	1/2"
T-316-2	1/2"	3/4"
T-316-3	1/2"	1"
T-316-4	1/2"	1.1/4"
T-316-5	1/2"	1.1/2"

#### **SENSOR CABLE**



#### **EXTENSION CABLE**



Part No.	Connection	Length (mm)	Part No.	Connection	Length (mm)
FS-SC1200	M8/Molex	1200	FS-EC1000	M8/M8	1000
FS-SC2900	M8/Molex	2900	FS-EC2000	M8/M8	2000
			ES EC5000	M8/M8	5000

#### **SPARE MULTI SENSOR**



Part No.	Flow capacity I/m
FS-S1-15	2-20
FS-S2-40	4-40
FS-S5100	10-100
FS-S10200	20-200

#### **SPARE PRESSURE/TEMP SENSOR**



Part No.	Pressure range Bar
PS-P10	0-10

#### **VORTEX DIGITAL SINGLE ZONE MONITOR**



Part No.	Flow capacity	Connection	Voltage
SZ-120	1-20 l/m	G 1/2	1830DC
SZ-240	2-40 l/m	G 1/2	1830DC
SZ-5100	5-100 l/m	G 3/4	1830DC

Stainless steel body and connection

12 bar

Protection class: IP 65/IP67.

from -10 to  $+90 \ C^{\circ}$ 

#### Description

- Integrated temperature measurement
- Flow measurement
- · Limit setting of flow and temperature
- · Alarm output signal
- Rotatable display
- Temperature range from -10°C to 90°C

#### WALL PLUG POWER SUPPLY



Material:

Pressure:

Temperature:

Part No.	Voltage input	Voltage output
SZ-P230	100-240V.	24 V.
Description		

Kit including: Wall plug cable, power supply and M12 Connector cable

#### **POWER SUPPLY**

Part No.	Voltage input	Connection	Voltage output
S7P-100	120 230 V	DIN Bail	2400

#### **POWER AND DATA CABLE M12**



#### WATERFLOW REGULATOR





Part No.	Main Connections inlet / oulet	Max.Temp.	Zones	Zone Connection	Dimension A
MPR02R	R 3/4"	95°C	2	R 3/8"	126
MPR04R	R 3/4"	95°C	4	R 3/8"	231
MPR06R	R 3/4"	95°C	6	R 3/8"	339
MPR08R	R 3/4"	95°C	8	R 3/8"	444
MPR10R	R 3/4"	95°C	10	R 3/8"	552
MPR12R	R 3/4"	95°C	12	R 3/8"	659

#### Description

Water flow regulators are ideal for regulating the flow rate of water passing through them as well as the water outlet temperature. The high quality construction and design make the unit one of the most competitive.

#### Technical characteristics

- The tube is made of Polyamide (standard).
- Zone Flow Capacity 0-18 L/M
- Interior and exterior bodies are made of PA 6 with 30% fibre glass.
- Brass regulating taps.
- Thermometers (standard).
- Stainless steel interior tie-rods.
- Vitrilic rubber o-rings (hardness: 70 SHA).



#### **FLOW MEASUREMENT**

#### **SPARE PART LIST**

7-7	No	Part No.	Description
	1	MPR-S-1	Inferior body 3/8 BSP connections
IO ••••	2	MPR-S-2	Inferior body with pipes
	3	MPR-S-3	Tube O-ring
	4	MPR-S-4	Polyamide tube
	5	MPR-S-5	Brass
0 0 0	6	MPR-S-6	Level clip
	7	MPR-S-7	Superior body
-18	8	MPR-S-8	Intermediate o-ring
19	9	MPR-S-9	Tap O-ring 21x3
	9.1	MPR-S-9.1	Tap O-ring Ø6x2
14/d	10	MPR-S-10	Тар
	11	MPR-S-11	Knob
	12	MPR-S-12	Thermometer
	13	MPR-S-13	End O-ring / left 28x35x3,5
	14 d	MPR-S-14d	Right aluminium end plate
	14 i	MPR-S-14i	Left aluminium end plate
	15	MPR-S-15	Intermediate plate
	17	MPR-S-17	Plastic cap
/	18	MPR-S-18	3/4" brass connector (optional)
2	20	MPR-S-20	Nut
	21	MPR-S-21	Tube security clip
	22	MPR-S-22	End O-ring / right 28x35x5,5

#### **FLOW INDICATOR**



	Flow Rate	e H²O LPM					Max Pressure
Part No.	Min	Max	Length	Ø mm	Thread	AF	(bar)
CFV1BN	1	10	59	25	1/4"	19	10
CFV2BN	2	20	71	30	3/8"	24	8
CFV3BN	3	30	71	30	1/2"	24	8
CFV4BN	4	40	106	47	3/4"	40	5
CFV5BN	6	60	106	47	1"	40	5

#### Description Use:

The CFV impeller flow indicators are generally used to monitor the correct flowing and circulation of a fluid into a pipeline. They are ideal for cooling and heating circuits, water treatment, and plastics processing equipment.

#### Note:

Flow rates refer to a vertical mounting with fluid inlet upwards.

#### Specifications:

Body	Nickel-plated brass
Impeller	Red Hostaform
Glass	Pirex
Seals	NBR
Max temperature	90°C

#### **DE-SCALING PUMP - WITH FLOW REVERSER**





Part No.	Tank Capacity	Flow Rate	Reverse system	Fittings	HP
DP15M	15 I.	48 l/min.	Manual	1/2"	0,2
DP15A	15 I.	40 l/min	Automatic	1/2"	0,17
DP30M	24 I.	90 l/min.	Manual	1/2"	0,45
DP30A	24 I.	91 l/min.	Automatic	1/2"	0,45

#### Description

Used for clearing blocked or badly corroded heating and cooling circuits on Injection Moulding Machines and Moulds. Even when not blocked a relatively thin layer of scale or corrosion can act as an insulator and have a huge impact on the efficiency of your circuit. Simply fill up the pump with the descaling fluid, connect the pump to the inlet and outlet of the circuit and turn on the pump. Regular reversal of flow direction, either manual or automatic, speeds up operation and assists in dislodging any solid matter present in pipework and cooling circuits.

By using the pump together with the recommended range of descaling fluids to remove both rust and limescale deposits. The descaling fluid contains a colour change indicator to monitor performance; the translucent tank means that the user can see when the red colour runs clear and is no longer effective. Use the neutralising fluid to create a pH neutral fluid which can be easily disposed of.

# Easy, safe and professional maintenance of mould cooling circuits and temperature controllers

- · Compact and portable
- Safe and easy to use
- Flow reversing system
- Full range of cleaning products available
- 4 models available to suit your application

# Mould Cooling circuits which are corroded or partly blocked by scale cause:

- Reduced flow
- · Reduced efficiency
- Longer cycle times
- Temperature problems
- Increased maintenance
- Faulty parts



#### **DE-SCALING SOLUTION**



Part No		ka	Weight	Conner	Steel	Stainless Steel	Aluminium	Brass	Tin	Light	Galvanised
DEODALI		ĸy	weigin	copper	01661	JIEEI	Alummum	DIass		anoys	
DESCALI	NG CHEMICALS										
RL10	Remover Liquid	10	10 kg	•	٠			(•)			
RL10P	Remover Plus Liquid	10	10 kg	•	•			(•)			
RP10	Remover Plus Powder	10	10 kg			•	•	٠	•	•	
NEUTRA	LIZING CHEMICALS										
NP10	Neutralizer	10	10 kg	•	•	•	•	•	•	•	•

#### Description

Remover Liquid

Concentrated descaling liquid with powerful reaction for systems and heat exchangers.

#### **Remover Plus Liquid**

Concentrated descaling liquid (non-fuming), with degreasing action, for systems and heat exchangers.

#### Remover Plus Powder

Concentrated descaling powder (non-corrosive, non-furning) for systems and heat exchangers.

Neutralizer

Neutralizing powder to remove residual acidity after descaling systems and heat exchangers. Also suitable for neutralizing descaling chemicals after use, thus making it possible to drain them.

# PRESSURE TEST UNIT

Description

Pressure test unit - for easy leakage test of Mould circuits Supplied with connecting hose and water tank

#### **TEMPERATURE CONTROL UNITS WATER/OIL**

Mouldpro Temperature controls are made to ensure reliable and accurate heating and cooling curcuits

- 24 month warranty
- Speck Pumps (Germany)
- SMC Solenoide valves ( cooling and filling ) in brass
- Stainless Heaters / Tanks
- Insulated Water tanks
- Safety thermostat
- Soft wheels

Optional: Serial Interface 4-20mA, RS 485, 0-10 volt

MOULDPRO	

Model		TCU-90	TCU-90L	TCU-90DC	TCU-120	TCU-150	TCU-200	TCU-200L
Fluid				Water			0	Dil
Maximum Temperature	°C	90	90	90	120	150	200	200
Heating Power	Kw	9	18	9	9	9	9	18
Cooling Capacity	Kw	40	40	Direct	Direct	80	20	40
Tank Capacity	Lit.	12	35	-	-	-	20	35
Pump Capacity	Max Flow (I/m)	60	60	70	70	40	60	60
	Max Pressure (bar)	3,5	3,5	2,2	2,2	5	3,5	3,5
	Power Kw	0,5	0,5	0,37	0,37	0,5	0,5	0,5
Connections Process	$\rightarrow$	3/4"	3/4"	1"	1"	3/4"	3/4"	3/4"
	$\leftarrow$	3/4"	3/4"	1"	1"	3/4"	3/4"	3/4"
Connections Cooling	$\rightarrow$	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
	$\leftarrow$	1/2"	1/2"	3/4"	3/4"	3/4"	1/2"	1/2"
Dimensions	mm (WxDxH)	295x575x495	365x750x785	325x610x750	325x610x750	325x610x750	330x610x690	365x750x785
Weight	KG.	40	60	50	50	55	50	60
Power Supply	V/Ph/Hz				400/3/50-60-PE			

Model	TCU-90	TCU-90L	TCU-90DC	TCU-120	TCU-150	TCU-200	TCU-200L
Features							
Acoustic Alarm	-	-	•	•	•	•	•
Mould drain/reverse pump direction	•	•	-	-	-	-	-
Liquid level sensor	•	•	•	•	•	•	•
Sensor failure monitor	•	•	•	•	•	•	•
Hose rupture/leakage monitor	•	•	•	•	•	•	•
Tank/Heaters made of SS	•	•	•	•	•	•	•
Security Thermostat	•	•	•	•	•	•	•
Automatic water filling	•	•	•	•	•	-	-
Castors	•	•	•	•	•	•	•
Solid State Relays	-	•	•	•	•	•	•
Magnetic Pump	-	-	-	-	•	-	-

#### **CORROSION, SCALE AND BIOLOGICAL INHIBITORS**

Non-Toxic Antifreeze Optimum Flow	Protection Biodegradable	lity Assured		
Performance Properties Mouldpro Inhibitors have been specially for Ethylene Glycol for use as an Industrial Grad Cooling and Heating systems.	mulated with Propylene or de additive for use in Mould	CoolFlo	CoolFlo	ThermaFlo
		IGE-25 Ethylene based	<b>NPT-25</b> Propylene based	DTX-25 Ethylene based
<b>Optimum Flow</b> : Improved heat transfer cha Dynamic Viscosity and higher Thermal Con	aracteristics, including; lower ductivity.	×		×
<b>Protection</b> : Contains synergistic corrosion commonly found in mould cooling systems	inhibitors to protect metals S.	×	×	×
<b>Biodegradable</b> : Mixtures are readily biode and will not remain in the environment or bi	gradable (90% over ten days) io-accumulate.	×	×	X
Scale Protection: Contains scale and biol fouling - thus promoting long operational li	ogical inhibitors to help prevent fe and high thermal efficiency.	×	×	×
<b>Non Toxic</b> : Has an toxicity rating: "Relative the Hodge & Sterner Scale.	ly Harmless" as confirmed by		×	×
Part No. IGE-25 NTP-25 DTV 25	<b>Type</b> Ethylene Propylene Ethylono	Temperature ran   -50 to +90°C   -50 to +90°C   50 to +90°C	ge	Container size 25 Ltr 25 Ltr 25 Ltr

#### REFRACTOMETER



Fall NU.	Juaic		FTUPytette Gtycol	Accuracy
RFM-200ATC	Brix	Yes	Yes	±0,1%
Includes				
Ethylene Glycol: -60°	°C - 0°C / 0-	·66.6%		
Dropulana Cluadu El		0 60 40/		

Propylene Glycol: -50°C - 0°C / 0-62.4%

Simple, accurate and repeatable measurement of concentration of glycol antifreeze with Automatic Temperature Compensation (ATC).

Includes calibration screwdriver, and case.

#### **DIGITAL PH METER**



Part No.	Measuring range	Resolution	Accuracy
PHM-100	0-14 pH	0,01 pH	±0,1pH

#### Includes

A great waterproof pH pen that will give you accurate pH measurements. There will be no need to use pH tricky test kits any more. It is very simple to use and the large LED display makes It easy to read. Kit includes 2 types buffer solution

#### MOULDPRO<sup>®</sup>

#### **FILTERS**

Inline filters specially designed for cooling channels or core cooling channels. The filter cartridge removes dirt particles, rust, or scale deposits. The temperature filter is made of stainless steel and brass. Easy maintenance of the filter:

- 1. Separate the 2 housing parts
- 2. Clean filter in an ultrasonic bath
- 3. Re-assemble the 2 housing parts

#### **INLINE FILTER**



Spare filter: SF-R1/4

#### **INLINE FILTER**



Part No.	Ø D	G	S	L	Filter area mm <sup>2</sup>
ILF-R3/4	32	3/4" BSP	29	93,5	2500
Description Spare filter: SF-R3/4					

#### **INLINE FILTER - WITH MAINTENANCE INDICATOR**



#### **STAINLESS STEEL IN-LINE FILTER - MPF-80-200**



Dirt particles in coolants often result in blockages in small cooling channels and can render mould inserts useless. This maintenance friendly Mouldpro stainless steel in-line filter MPF-80-200 offers superior low cost protection against foreign body particles, in particular for conformal cooling channel of injection moulding tools.

The filter can be flanged to the mould or operated in conjunction with temperature control units.

## Sure protection of your temperature cooling channels

High filter performance is based on a starshaped folded stainless steel sieve that prevents the ingress of all particles of  $>200 \,\mu\text{m}$  into the cooling channel.

#### Versatile use

The filter is suitable for use with water- or oilbased coolants with a flow volume of up to 80 l/ min and offers versatile application possibilities within a temperature range of -10 to 260°C.

#### Simple maintenance

A maintenance friendly concept allow easy removal of the filter insert, which can be cleaned with compressed air, in an ultrasound bath or by means of a high pressure cleaner. The filter housing remains in the system circuit.

The MPF-80-200 can be supplied with an optional maintenance indicator.

All advantages at a glance:

- Low cost with high filter performance
- Simple maintenance and cleaning
- Suitable for high flow volumes
- Large temperature range





Part No. MPF-F Filter insert

Technical data	
Material	Stainless steel 1.4305
Connection thread	G 3/4"
Coolant	Water / oil
Pressure range	PN 16
Operating temperature	-10°C / 260°C
Seal	PTFE
Dimensions	76 x 56 x 131 mm (L x W x H)
Weight	approx. 1.3 kg

#### Design according to:

Pressure Equipment Directive 97/23/EU, pressure equipment type acc. to Art.

1: container, fluid acc. to Art. 9: group

2: others acc. to Art. 3, para.

3: good engineering practice, suitable for max. 1,000 full cycle motions.



Part No. MPF-M Maintenance indicator Part No. MPF-0 0-Ring

Filter insert	
Material	Stainless steel 1.4305, adhesive-free, rolled
Mesh width	200 µm
Filter surface	approx. 150 cm <sup>2</sup>
Connection	Thread connector
Dimensions	Ø 32 X 76 mm

Maintenance indicator (optio	nal)
Principle	Differential pressure measurement
Seal	PTFE O-ring
Dimensions	45 x 30 x 66 mm (L x W x H)

1	0-Ring			
	Material	PTFE		
	Dimensions	Ø 45 X 1.5 mm		