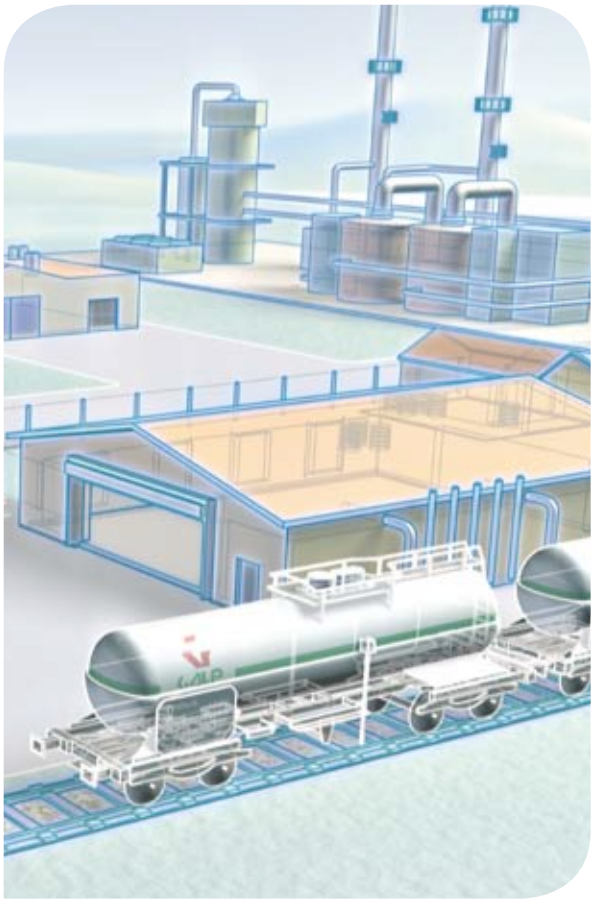


Chemical Distribution and Chemical Plant

From Applications to Products

+GF+

GEORG FISCHER
PIPING SYSTEMS

Table of Contents

GF Piping Systems

Your global system provider

We are dedicated to designing, manufacturing and marketing piping systems for the safe and secure conveyance of liquids and gases.

We put customers first

- Customer needs guide our product development
- We offer customer support and training worldwide
- We measure your satisfaction

We act fast

- Local presence worldwide
- Superior logistics
- Speed in all details

We do what we say

- Tested quality
- Always trustworthy

Your benefits at a glance

Global training

- Different materials and products
- Installation techniques
- Connection and jointing techniques

Global planning

- Professionally trained staff
- Planning documentation (online, CD-ROM and Media Cockpit)
- Product library (online and CD-ROM)
- Online catalogues

Global standards

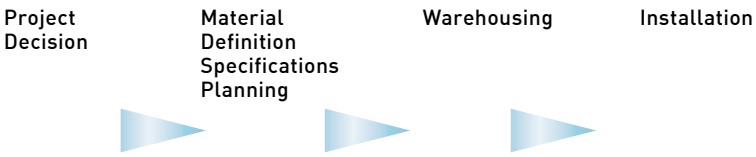
- ISO
- BS
- ASTM
- JIS

Global distribution network and availability

Added Value

GF Piping Systems at your service

We support you throughout



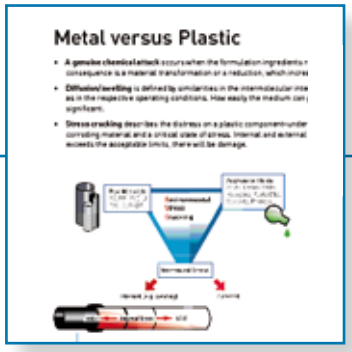
	End Customer	Engineering Company	Distributor	OEM/Installer
piping system solutions consulting	■	■	■	■
technical and cost optimization	■			
mechanical and chemical advice	■	■		
material recommendation	■	■		
CAD library		■		■
planning fundamentals training		■		■
documentation (printed and electronic)	■	■	■	■
submit an offer	■	■	■	■
jointing technologies and installation training				■
efficient distribution system			■	■
local certificates and approvals	■	■	■	■
international standards	■	■	■	■
global subsidiaries	■	■	■	■

Brandname		Material
SYGEF® Standard	→	PVDF
SYGEF® Plus	→	PVDF High Purity
SYGEF® PFA	→	PFA
PROGEF® Standard	→	PP
PROGEF® Plus	→	PP Cleaned
PROGEF® Natural	→	PP-R Natural
COOL-FIT™	→	ABS Pre-insulated
CONTAIN-IT PLUS	→	Double Containment Piping
FUSEAL	→	PP Flame-retardant or PVDF
ELGEF	→	PE Electro Fusion Fittings

1 Start with your Process

2 Select your Application

3 Find your System Solution



4 See Technical Information

5 Add Products

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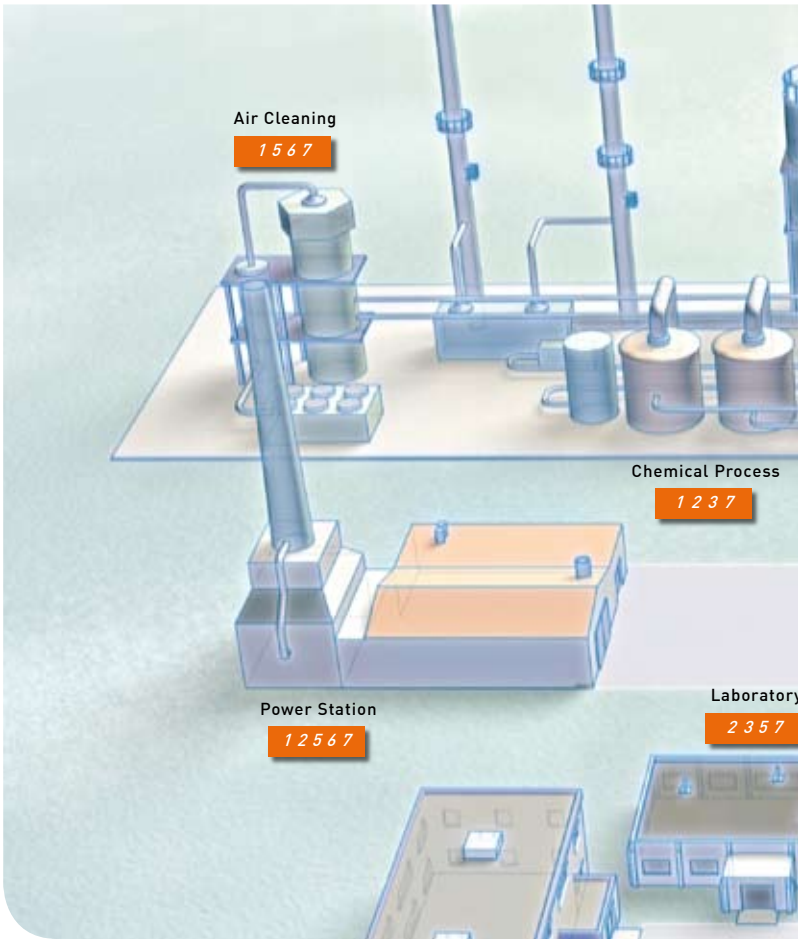
We supply what you are looking for

Chemical Plant

GF Piping Systems operate behind the scenes in many of the processes and applications. We do our utmost to bring quality to production, products and people`s lives.

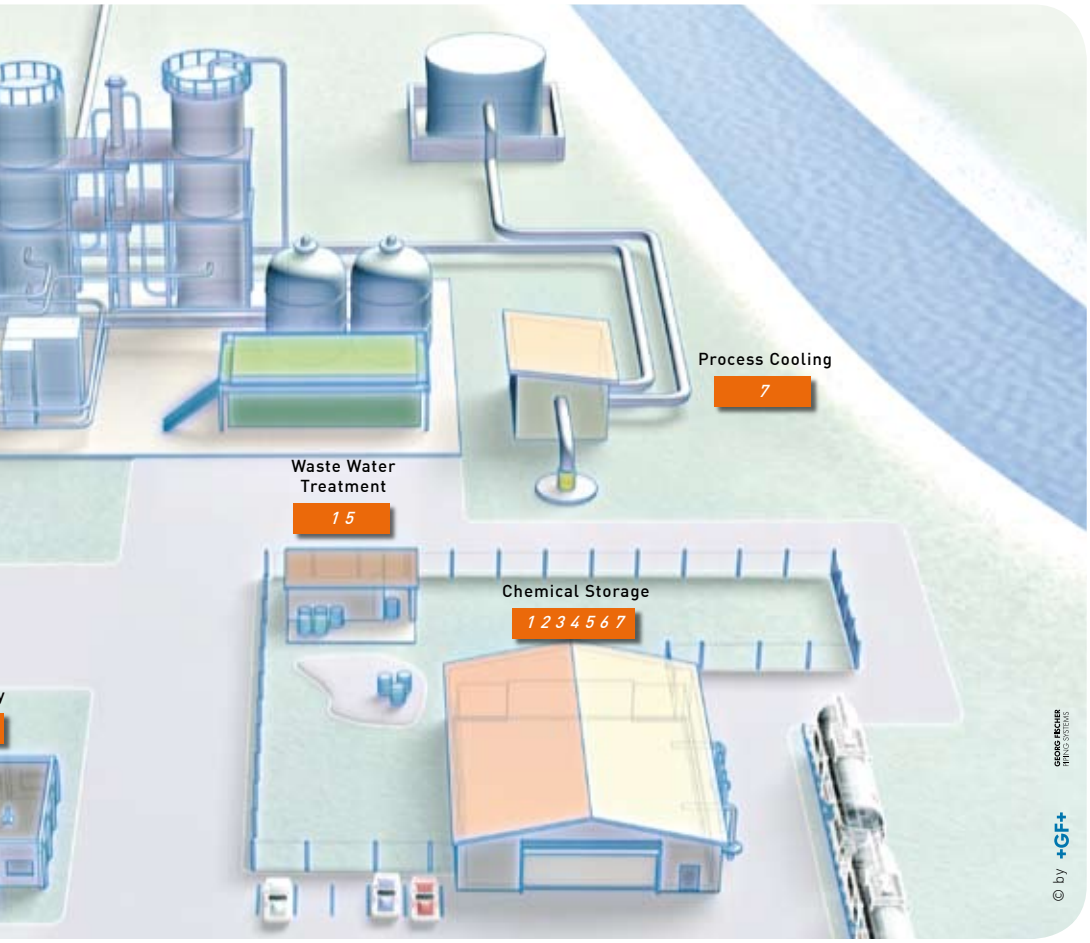
Your applications - our piping systems
Thermoplastic piping systems have been relied upon for decades to convey media, whether it`s water or hazardous liquids for industrial applications (please see layout on the right side).

Plastics can do more
- nearly no corrosion
- safe and economical system solutions
- low maintenance
- long life time
- simple, fast but high quality installations
- world-wide presence of GF Piping Systems



Chemical Plant

Imagine all the products in your daily life, where chemicals are used and needed. Production of chemicals is essential for our comfort, health, food and many others.



1 Filling of Tanks

2 Dilution

3 Mixing

4 Draw off Station

5 Neutralisation

6 Air cleaning

7 Process Water & Process Cooling
Vacuum & Compressed Air

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We provide your solution

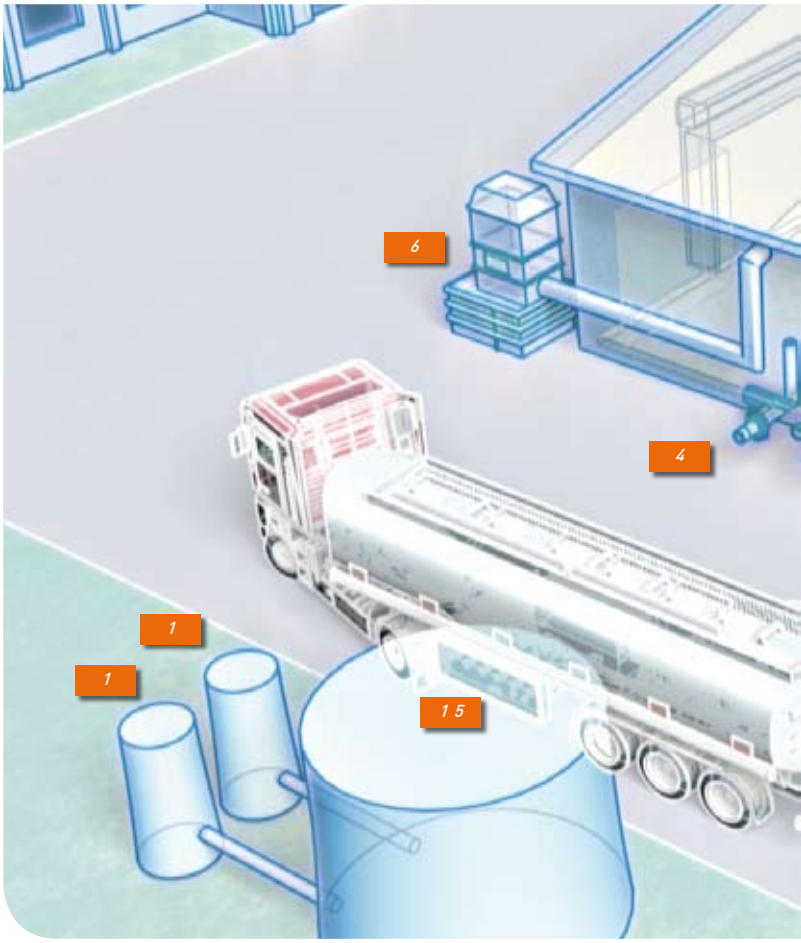
Chemical Distribution

GF Piping Systems are predestined for all applications involved in chemical distribution primarily for acids, alkalis and chemical mixing.

Choosing the appropriate piping system including automation offers many advantages such as increased productivity, decreased production and maintenance costs and improved product quality to name but a few.

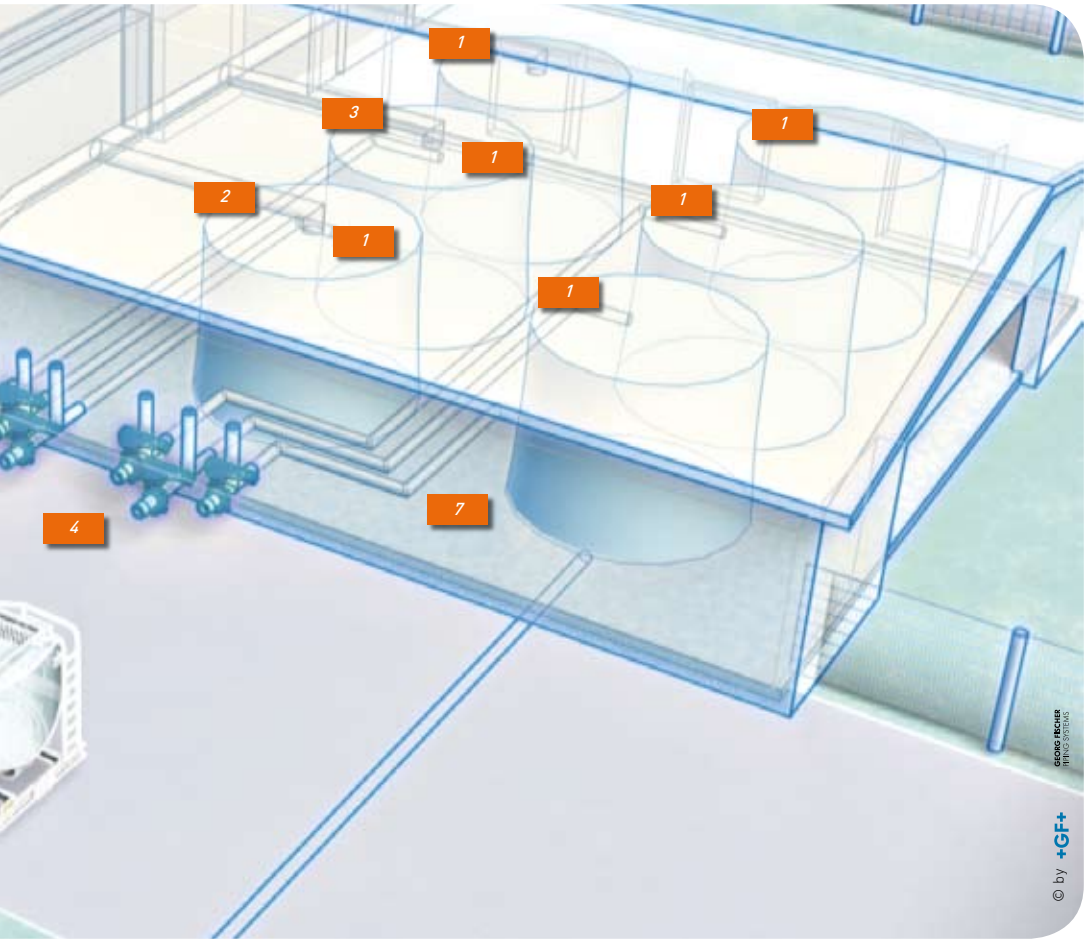
Typical chemicals are hydrochloric acid, formic acid, sulphuric acid, hydrofluoric acid, nitric acid, phosphoric acid, acetic acid, ferric chloride, caustic soda and caustic potash in different concentrations and purities. Select the correct piping systems for your chemicals with the help of our professional staff.

Safe conveyance and exact dosing are mandatory in all areas of the plant.
GF Piping Systems completely satisfy all the exacting requirements placed on piping systems with regard to chemical resistance, ambient temperature, low operating pressure and accurate, reliable dosing and measuring.



Chemical Distribution

Transporting chemicals in the highest quality, different concentrations and exact dosages is a must for all customers in the chemical process industry, surface treatment and many others.



1 Filling of Tanks
2 Dilution
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4 Draw off Station
5 Neutralisation
6 Air cleaning
7 Process Water & Process Cooling
Vacuum & Compressed Air

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Quantity	Product	Page
1	Flange PP-V DN50	19
1	Butterfly valve, manual Type 567	23
1	Filler and breather Type V 91/V 95	11
1	Diaphragm gauge guard Type Z 700	23
1	Paddle wheel sensor/Flow sensor Type 2536	19
1	Ball valve, manual Type 546	23
2	Ball valve, electric Type 130	15
1	Wafer check valve Type 369	11
1	Batch controller Type 5600	19

Quantity	Product	Page
1	Pressure relief valve Type V 185/V85	13
1	Solenoid valve Type 165	19
1	Level transmitter Type 8250	11
1	Variable area flow metres Type SK series	11
1	Water jet suction pump Type P 20	11
1	Level sensor Type 2250 (+ submersion skid)	13
1	Diaphragm valve Type 314	13

Filling of Tanks

In every production where liquids are needed for the process, tanks need to be filled. With the total GF Piping Systems fast, easy and reliable filling is guaranteed.

Filling of Tanks

Application Description

A simple system installation from GF Piping Systems using the principle of parallel pipes with compressed air, allows you to convey all your liquid media resulting in no or using a smaller pump. Recent regulations now advise that chemical tanks may not be drilled anymore. Tanks with height above 7 m generate pump head problems. With Signet level sensor and submersion skid measuring of even harsh chemicals becomes safe. Using the GF Piping Systems solutions offers longer life time expectancy for your whole installation.

Water Jet Suction Pump Type P 20

It can be used where pressurised fluids are available as a propellant. They are used for mixing chemicals and dilution of chemicals in line. The basic principle of the jet suction pump is that the propellant liquid passes through a nozzle and draws in the mixing media and is mixed together in line.

Air Relief Valve Type V 91a/V 95

The V 91/V 95 filler and breather valves are primarily used where containers and pipes have to be aerated and/or vented. Method of operation is simple but effective, as the level of the liquid falls the valve opens. In case the liquid rises the float is raised and pressed against a seal, closing the valve.

Level Transmitter Type 8250

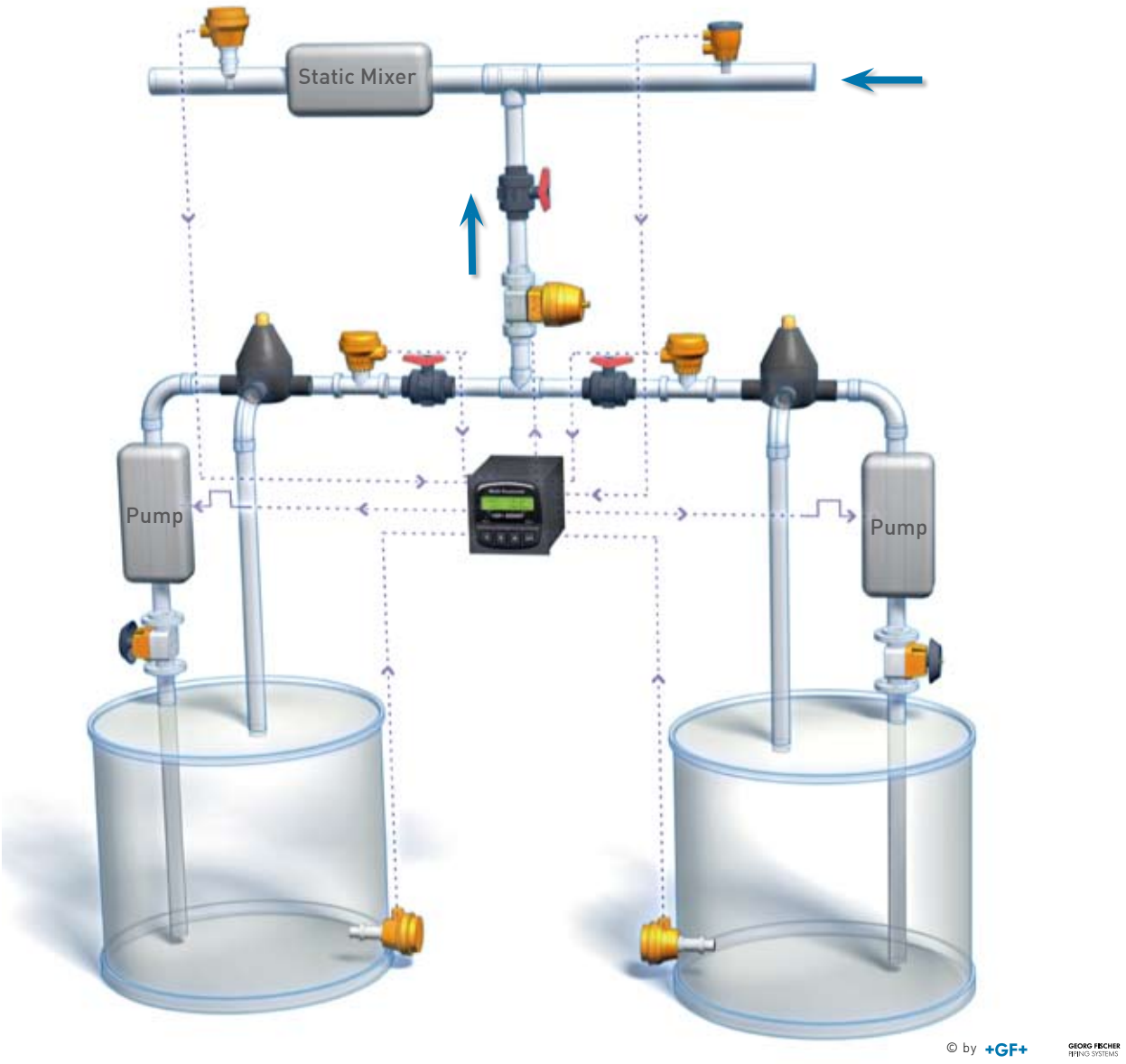
The transmitters are compatible with the GF Signet 2250 level and 2450 pressure sensors. The instrument is available in field and panel mount configurations, single or dual channel input and equipped with mA output. Other features include fully scaleable, user defined units and automatic level to volume conversion.

Variable Area Flow Meter Type SK Series

The plastic variable area flow meters in the SK series from GF Piping Systems are radially installed, dismountable meters for measuring the rate of flow in industrial pipework applications. The flow meters can be used for a wide range of applications and a great variety of media.

Wafer Check Valve Type 369 and Ball Check Valve Type 360

The wafer check valves prevent the medium from flowing back and are available in PVC-U, PP and PVDF with reset springs in V4A and Hastelloy for chemical processes. These wafer check valves are suitable for vertical and horizontal mounting. They are robust and maintenance free and admitted for a nominal pressure of 6 bar. Available are as well our ball check valves for smaller sizes.

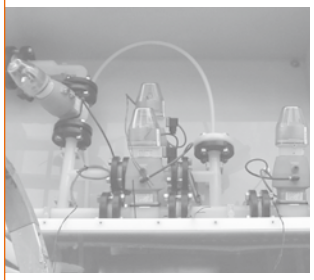


Quantity	Product	Page
2	Level sensor Type 2450	13
2	Diaphragm valve, manual Type 314	13
2	Pressure relief valve Type V 185/V85	13
3	Ball valve, manual Type 546	23
1	Diaphragm valve, pneumatic Type DIASTAR 028 FC	17

Quantity	Product	Page
1	Temperature sensor Type 2350	13
3	Electro magnetic flow sensor Type 2551 (magmeter)	13
1	Multi channel transmitter Type 8900 (parameter controller)	21

Dilution

Dilution of chemicals, even harsh ones, requires highly specialised and safe solutions. GF Piping Systems offers what you are looking for.



Dilution

Application Dilution

This dilution skid designed with SYGEF® Standard Piping Systems and BCF welding technology can be used for harsh chemicals. The aggressive liquids are dosed in small quantities directly into the main pipe where a static mixer takes care of the dilution. GF Signet temperature sensors offer a higher safety system for the resulting exothermic reaction.

Temperature Sensor Type 2350

The GF Signet temperature sensor has a one piece injection moulded PVDF body to provide excellent chemical resistance. It also outlasts metal sensors in aggressive media and eliminates the need for costly thermowells.

Pressure Relief Valve Type V 85/V 185

The pressure relief valve serves to keep the working pressure constant, to balance out pressure pulsation and to reduce peaks in chemical process systems. Special features include good control characteristics, control unit is hermetically separated from flow medium, by standard EPDM or EPDM-PTFE coated diaphragm.

Electro Magnetic Flow Sensor Type 2551 (Magmeter)

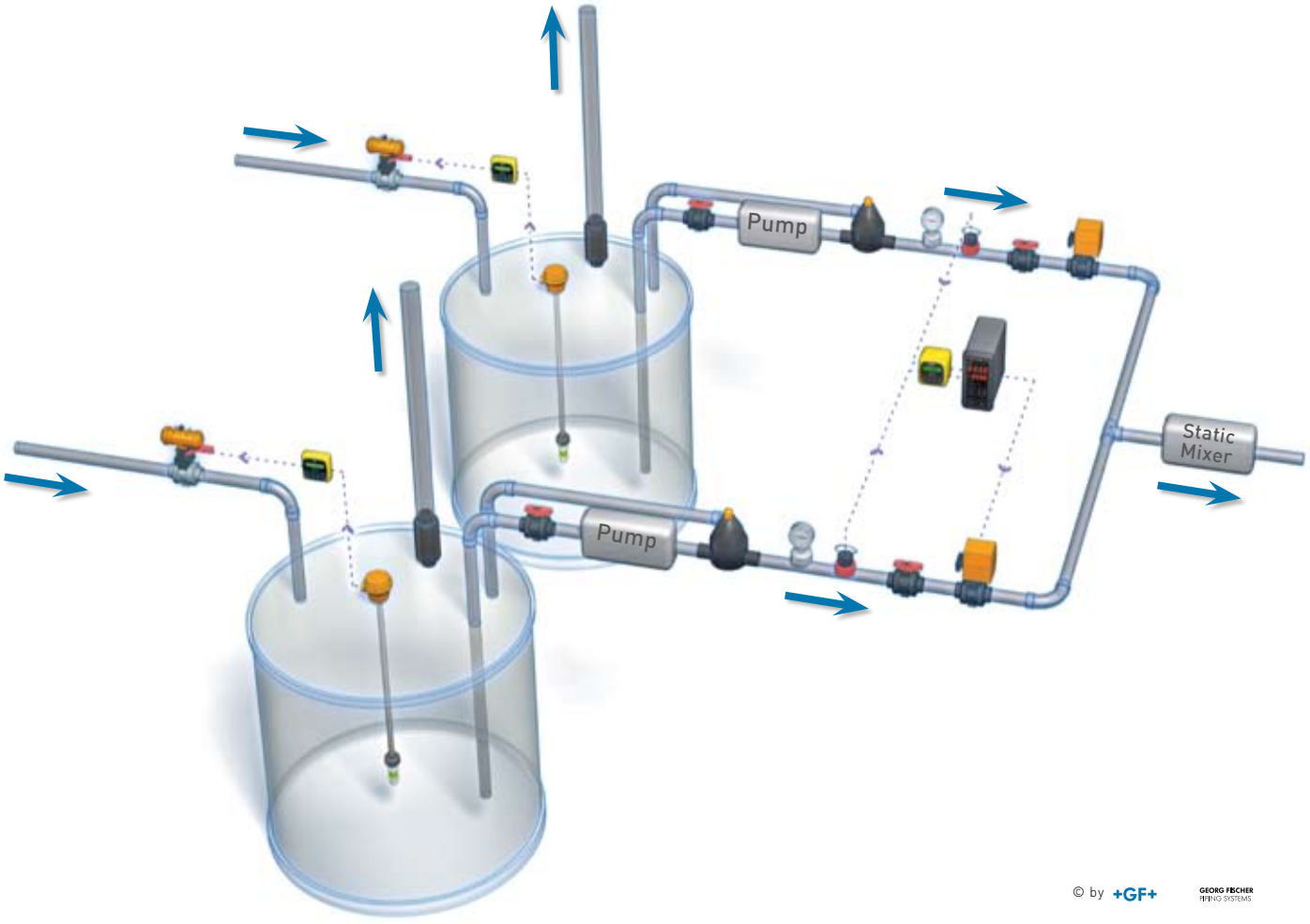
It is an insertion style magnetic flow sensor that features no moving parts. The patented sensor design is available in corrosion resistant materials to provide long term reliability with minimum maintenance costs and outstanding features: bi-directional flow, empty pipe detection, various outputs, no pressure drop, high repeatability with accurate measurement even in dirty liquids and LCD option.

Diaphragm Valve Type 314

Proven and reliable GF Piping Systems know how offers the highest corrosion resistant diaphragm valves with its outstanding features: one piece body, compact design, modular system, visual indicator, self draining which is installation dependent.

Level Sensor Type 2250/2450

The GF Signet Level sensor for level and depth control has a one piece injection moulded PVDF body and ceramic diaphragm for superior compatibility in corrosive liquids with full submersibility.



Quantity	Product	Page
2	Ball valve, pneumatic Type 230 + pilot valve Type PV 94	17
2	Filler and breather Type V 91/V 95	11
2	Level sensor Type 2250 (+ submersion skid)	13
4	Ball valve, manual Type 546	23
2	Pressure relief/Reducing valve Type V 185/V85	13

Quantity	Product	Page
2	Diaphragm gauge guard Type Z 700	23
2	Paddle wheel flow sensor Type 515	19
1	Industrial ratio controller PE 65/PID	15
2	Ball valve, electric 130 + ratio controller PE 25 with linear ball	15
2	Level transmitter Type 8250	11
1	Flow monitor Type 8550	21

Mixing: Ratio Control

The mixing of chemicals can be done in various ways. With this ratio control in-line mixing you are choosing a safe and highly cost effective solution.

Application Mixing

The in-line mixing process to be carried out is fully automated via the ratio controller. This method allows precise dosing and is extremely cost efficient. Indicating both flow rates it adjusts the ratio accordingly and automatically controling the process. Especially interesting for installations requiring gravity flow.

Electrical Actuated Ball Valve Type 130

The types 130 - 135 consist of the type 546's valve base body with the electric actuator EA series. With its modular system manual valves can be actuated more efficiently and economically.

Industrial Ratio Controller Type PE 65

The PE 65 operates for precise cost effective control. This is a modular controller which ensures fast replacement of internal modules without any tools. Simple operation via four robust keys are used for all settings and adjustments. Benefits of the PE 65 include bright LED displays, precise control behaviour and switching or alarm outputs.

Electrical Actuators

Type EA 11

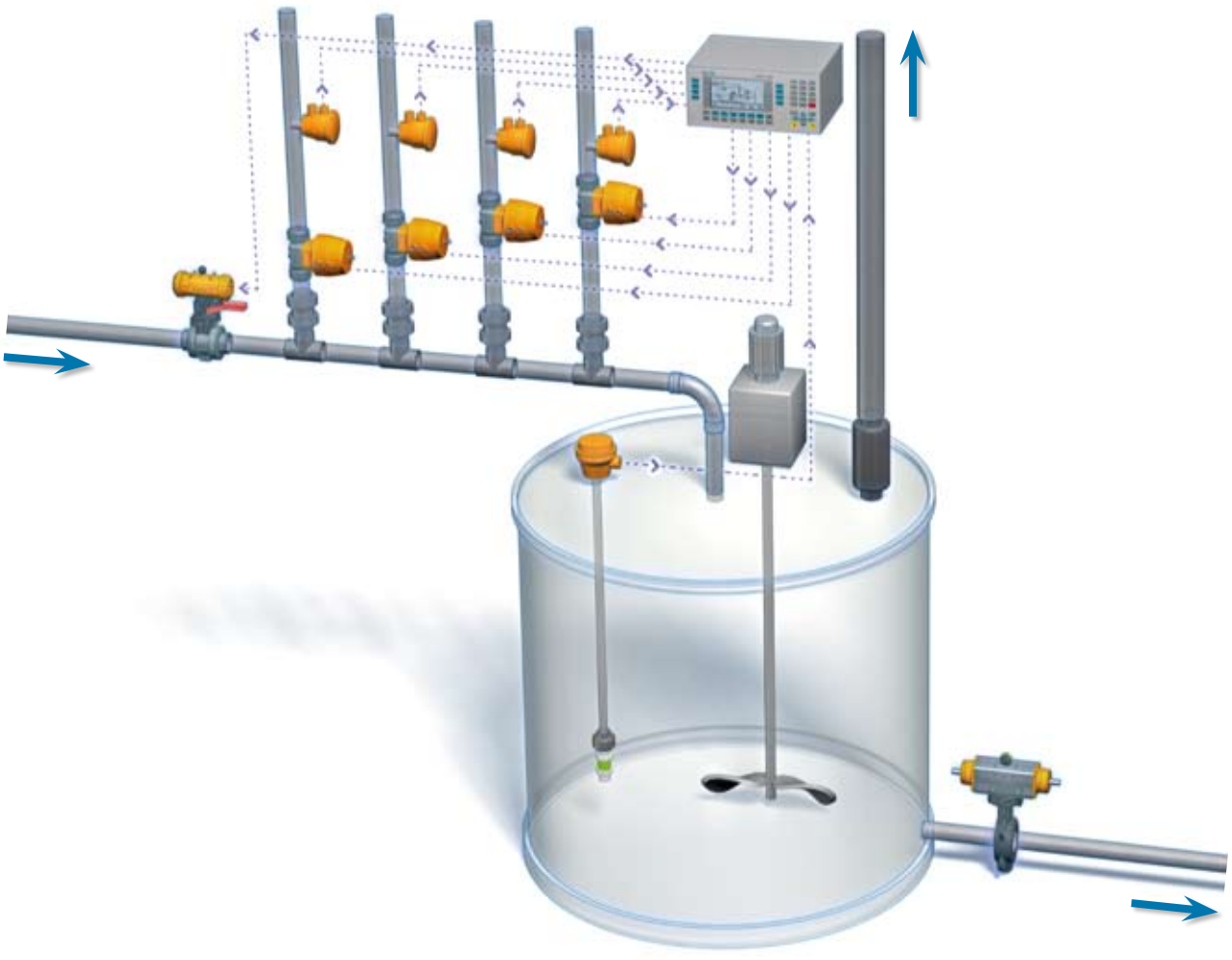
Is a basic version for open/close operation for smaller torques. It is expandable to include fail safe return, heating element and two additional limit switches for feed-back.

Type EA 21

Is an improved version of the EA 11. This model indicates operation continuous, 100% duty cycle and has a full range of accessories. This includes cycle time extension, cycle time monitoring, cycle counter, motor current monitoring, position signalization and a positioner. An ASi module can also be fitted for networking.

Type EA 31/42

Are mainly used for high torques with full range of accessories. Both actuators are ideal for all kinds of control tasks. Benefits of the EA series: flexible configuration due to modular design, reduced installation costs, intelligent self learning accessories, numerous monitoring and control options, fail safe return options, long cycle life, worldwide certification.



Quantity	Product	Page
1	Ball valve, pneumatic Type 230 + pilot valve	17
4	Electro magnetic flow sensor Type 2551 (Magmeter)	13
4	Diaphragm valve, pneumatic Type DIASTAR 028 FC + pilot valve	17
1	Multi channel transmitter Type 8900 (parameter controller)	21
1	Filler and breather Type V 91/V 95	11
1	Level sensor Type 2250 (+ submersion skid)	13
1	Butterfly valve, pneumatic Type 240	23
1	Level transmitter Type 8250	11
5	Pilot solenoid valves Type 165	19
4	Ball check valves Type 360	11

Mixing: Batching

If the process requires a variety of chemicals, this batching solution provides highest safety standards, especially if it is combined with the double containment system.

GF Piping Systems is providing a total system that is cost effective and satisfies relevant health, safety and waste water regulations. There are individual lines for receiving the chemicals which are supplied to the plant in a bulk. Each chemical line, designed for the individual chemical, feeds into the main batch pipework. Using GF Piping Systems control equipment guarantee a precise and accurate batching process.

CONTAIN-IT
Wherever environmentally hazardous media need to be conveyed, the accident risk can be practically avoided with the use of double containment system and leaks detection.

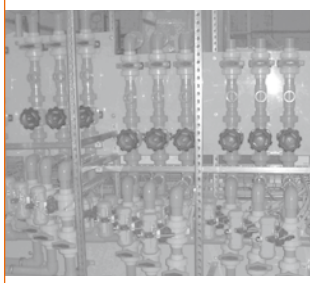
Liner pipes
Liner pipes for production of dual-laminate piping for higher temperature and pressure is widely used in many chemical processes. Our inner liner pipes offer outstanding chemical resistance.

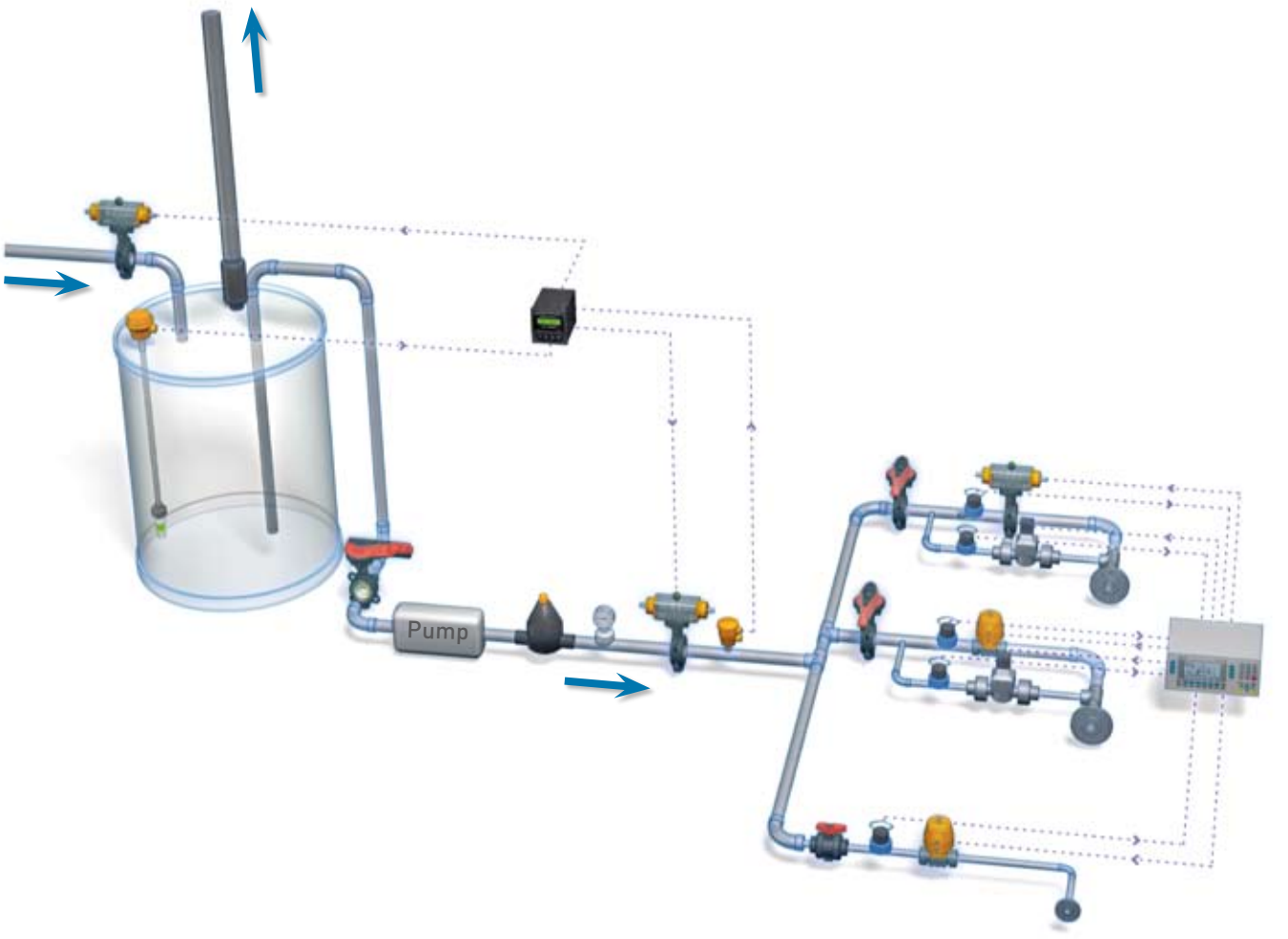
Pneumatic actuated diaphragm valve type DIASTAR family
The DIASTAR family consist of the type 314's valve base body with the pneumatic actuator. With its modular system manual valves can be actuated more efficiently and economically.

DIASTAR Type 028
Is ideal for all standard applications up to 10 bar that require integrated accessories such as an interface for accessories that allow the linking of the actuator effortlessly to the control system. This valve offers outstanding price-performance ratio.

DIASTAR Type 025
Is the strongest one in this series, because of its high closing forces. Wherever high line pressure exists, up to 10 bar on both sides, this valve offer excellent features with an integrated interface and available in the modes of operation: FC, FO and DA.

Pneumatic Ball Valve Actuator Type 230
The PA11 and PA21 pneumatic actuators can be mounted on ball valves type 546. By using the correct coupling piece and selecting a suitable adapter plate, the actuators are connected to the multi-functional module with the provided clamps. The purpose of these actuators is to actuate ball valves with a control pressure of 2.8 to 5 bar and up to a driving torque of 20Nm.
They are available with single or double acting with springs for FC (fail closed) or FO (fail open). These valves can be controlled to open or close positions via a built-in solenoid valve.





Quantity	Product	Page
3	Butterfly valve, pneumatic Type 240 + pilot valve Type PV 94	23
1	Level sensor Type 2250 (+ submersion skid)	13
1	Filler and breather Type V 91/V 95	11
3	Butterfly valve, manual Type 567	23
1	Ball valve, manual Type 546	23
1	Pressure relief valve Type V 185/V 85	13
1	Diaphragm gauge guard Type Z 700	23
1	Electro magnetic flow sensor Type 2551 (Magmeter)	13

Quantity	Product	Page
2	Solenoid valve Type 165	19
1	Batch controller Type 5600	19
1	Diaphragm valve, pneumatic Type DIASTAR 025 FC	17
1	Diaphragm valve, pneumatic Type DIASTAR 028 FC	17
1	Multi channel transmitter Type 8900 (parameter controller)	21
5	Flow sensors Type 2536	56

Draw-off Station

In every chemical plant and chemical distribution facility this area places outstanding demands to its piping systems because of hundreds of different and often very harsh chemicals.

In this area PVC-U or PVDF are used, due to their excellent and wide chemical resistance. It is possible to bottle exactly predefined volumes with batch controllers combined with flow sensors. The chemical batch can be conveyed into cans, iso bulk containers (IBCs) or trucks.
Using the GF Piping Systems solution which includes the GF Signet electro magnetic flow sensor Type 2551, the electromagnetic solution to fluid measurement with the best price-performance ratio in the industry can eliminate the need for batch weighing.

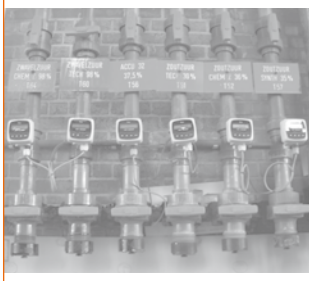
Flange
The corrosion free reinforced PP flange shows the following properties: high chemical resistance, maximum break resistance, UV stabilised, self-centering of the flanges on the flange adapters and a symmetric design allows double-sided insallation.

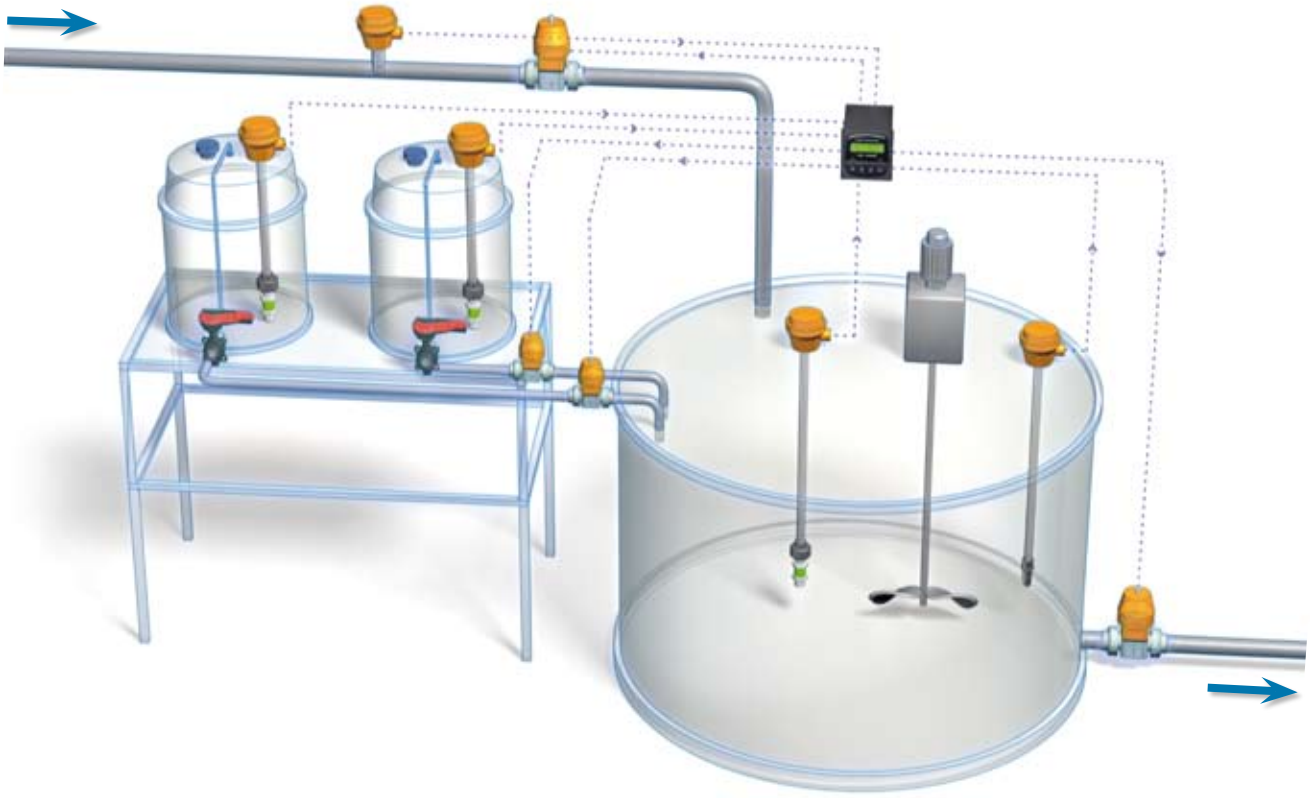
Solenoid Valve Type 165
The Type 165 solenoid valve is a 2/2 way with 3 way pilot control valve. It is controlled exclusively via the pressure of the medium by means of the pilot valve. Its features include a 100 % duty rating, integrated manual override, chemical resistant materials of construction and a variety of operating voltages.

Reducers
A wide range of special products such as reducers in diverse diameters are completing the GF Piping Systems product range in order to be your system solution provider.

Paddle Wheel Flow Sensor Type 515
This model is offered in a variety of materials for a wide range of pipe sizes (DN15 up to DN900) and insertion configurations. It is easy to install, highly repeatable output, self-powered and due to its high chemical resistance and robust design generates minimal maintenance.

Batch Controller 5600
The GF Signet batch controller provides control capability and process fine-tuning in a familiar package. The programming interface uses a four-button keypad and an intuitive procedure for adjusting a batching system to the best performance possible. Advanced features include a user-set security code, an automatic calibration option and overrun compensation.





Quantity	Product	Page
4	Diaphragm valve, pneumatic Type DIASTAR ECO/FC	21
1	Multi channel transmitter Type 8900 (parameter controller)	21
3	Level transmitter Type 8250	11
2	Butterfly valve, manual Type 567	23
1	pH sensor Type 2754	21
1	Flow sensor Type/Paddle wheel sensor Type 515	19
1	Electro magnetic flow Type 2551 sensor (Magmeter)	13
1	Level sensor Type 2250 (+ submersion skid)	13

Neutralisation

Water treatment is becoming a common practice in every industry to reduce effluent water costs by processing waste water and reusing it later in the process.

Every industry has to deal with waste that is classified as either suspended solids, metals, acids and alkalis, organics and nitrogen compounds.
Each classification of waste water requires the treatment process to be monitored with instrumentation from the moment the water enters the treatment facility until it is properly treated and discharged.

For more information see our water treatment brochure GMST_5908.

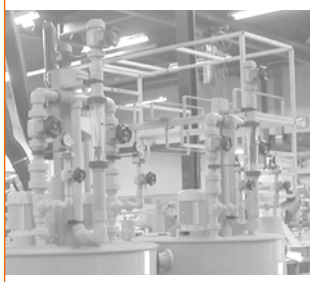
pH Sensor Type 2714
Feature-packed GF Signet 2714 - 2717 twist lock pH and ORP electrodes provide unsurpassed simplicity, reliability and accuracy. With a rugged construction, large reference volume and intelligent positioning of internal elements combine to extend the service life of the dependable electrodes.

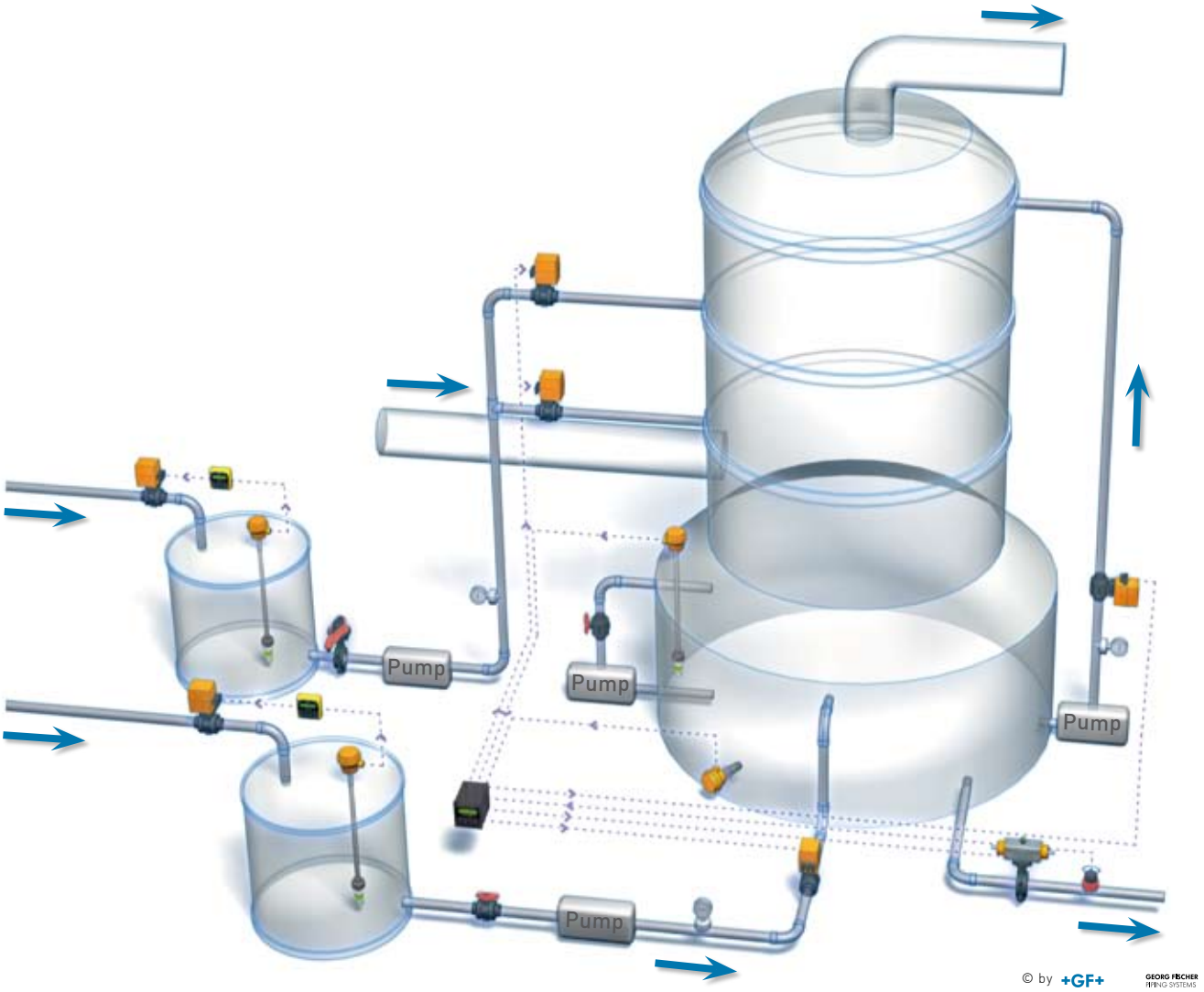
PRO-FIT
This exclusive design saves you time, space and money. This system sets new standards with spigot/socket fittings made of PVC-U and generates added value for plant and equipment builders. The fittings enable direct jointing of fitting to fitting.

DIASTAR Eco
This actuator has been optimized especially for elastomer diaphragms and 6 bar working pressure. The perfect solution if you are looking for an economical valve with compact dimensions and long life cycle.

GF Signet Multichannel Transmitter Type 8900
The GF Signet 8900 multiparameter controller takes the concept of modularity to the extreme. Using simple to install modular boards into the base unit, a number of inputs, outputs and relays can be achieved. There are notable features that the 8900 offers, e.g. digital input, long cable runs, advanced relay logic, derived mathematical calculations, multi-language display and multi relay outputs.

Flow Monitor Type 5500
The GF Signet 5500 Flow Monitor is an instrument which comes fully equipped with all of the basic tools needed for monitoring and controlling a flow system. The analog dial enables the user to easily read instantaneous flow rate, while the backlit LCD is useful for calibration, set-up and displaying totalized flow volume. Connect any of Signet`s wide array of flow sensors, then consider which output features are best for your application.





Quantity	Product	Page
6	Ball valve, electric Type 130	15
3	Level sensor Type 2450 (+ submersion skid)	13
1	Butterfly valve, manual Type 567	23
3	Diaphragm gauge guard Type Z 700	23
	Exhaust pipe	23
1	pH sensor Type 2714	21

Quantity	Product	Page
2	Ball valve, manual 546	23
1	Multi channel transmitter 8900 (parameter controller)	21
1	Butterfly valve, pneumatic 568	23
3	Level transmitter 8250	11
3	Paddle wheel sensor/Flow sensor Type	19

Air Cleaning

Many chemical sites have a need to clean air which is contaminated with chemicals. Piping from GF Piping Systems is running your process nearly maintenance free.

Fume Scrubbers use liquids to dissolve, trap or chemically react with other liquids or gases to remove air polluting contaminates. Properly designed fume scrubbers are very effective in removing particles, dust, aerosols, and oxides that are smaller than 10 microns.
To effectively remove particles, proper contact time between the gas or liquid is very important.

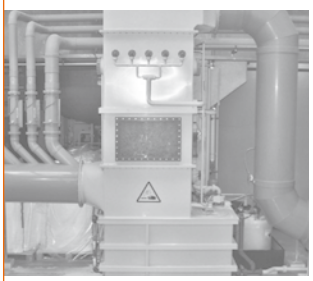
Diaphragm Gauge Guard Type Z 700/Z 701
The diaphragm protected gauge guard is used when measuring the pressure of liquid media. The manometer is separated from the medium by a PTFE-coated diaphragm for highest chemical resistance. The large area of the diaphragm and the low compressability of the buffer fluid ensure an accurate display.

Ball Valve Type 546
GF Piping Systems quality by design and its innovative features make this ball valve unique. Features: modular system, compact design, floating ball permits tight seal, highly dynamic backing seals result in maintenance free operation, defined breaking point.

Butterfly Valve Type 567/568
Unique double excentric plastic butterfly valve with many options due to the multifunctional principle. Many excellent features characterize this product: double excentric principle, reduced torque, less wear, lockable, 5° ratchet setting, in all GF Piping Systems plastic types available, double internal shaft sealing on both sides for a non welted shaft, integrated electric position indicator and many others.

Butterfly Valve Pneumatic Type 240
The pneumatic butterfly valve consists of standard types 567 and 568 's valve bodies with pneumatic actuator PA 30 - PA 55 (see Type 240, above).

Exhaust Piping
Non pressure rating piping system for exhaust applications. Four different systems offer light and easy to install corrosion free systems.



COOL-FIT™

COOL-FIT™ is a complete system solution for cooling systems. The system is based on pre-insulated ABS pipes and fittings with outer jackets in either black or white PE. This system is delivered ready to install using high density PUR 45 kg/m^3 as the insulation material, the PUR is CFC free and recyclable. Working temperatures range from -50° C to +40° C for preinsulated systems with a maximum working pressure of 10 bar (based on water at 23° C).

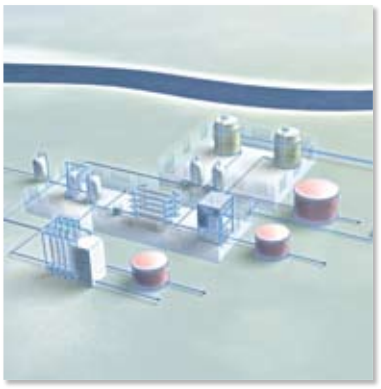
ELGEF Plus and PE

The fastest and most reliable jointing of PE is using ELGEF Plus electrofusion couplers which join all PE pressure pipes and spigot fittings. Modularity is the strength of ELGEF Plus. Each individual fitting and saddle is made to match and when put together, form reliable and leak-proof connections. Installation engineers create tailor-made solutions on-site according to your individual requirements.

SYGEF® PFA

The SYGEF PFA line completes the total plastic solution for the distribution of high purity chemicals, high purity water and slurries up to 200°C. The new PFA tubing shows significantly improved characteristics in surface roughness and permeation behavior. A highly innovative flaring technology ensures absolute leak tightness due to it's triple sealing system even at elevated temperatures. Long lasting and extreme reliable manually and automatically activated valves are completing the system.

More Applications



Industrial Process Water

Industries require high water quality to feed boilers, processes, cooling systems, etc. Avoiding contamination, scale formation and corrosion in these systems is essential.
Our high quality valves, our inert plastic materials, our reliable instrumentation and our high level of expertise allow GF Piping Systems to provide our customers with reliable quality systems.
(Water Treatment Document Number GMST5908)

Process Cooling

Water for the cooling process, whether temperature controlled or not, is one of the principal demands in the chemical process industry. It is used extensively in heat exchangers and reclaim equipment or high-tech manufacturing processes. The PE, PROGEF® Standard, PVC-U and COOL-FIT™ product lines are corrosion-free, in addition to the internal pipe surface being free of encrustation.

Vacuum

Complete systems for use in applications down to absolute vacuum, including valves in rigid plastics with low pressure loss, e.g. PE, PROGEF® Standard and PVC systems which offer high corrosion resistance and virtually no maintenance.

Compressed Air

Complete systems in PE offer improved efficiency with smooth bore pipes, combined with reliable and simple installation technology.

Metal versus Plastic

What is corrosion?
Corrosion is a natural process. It is a reaction of materials with substances from the environment. This reaction is comparable with a gradual destruction that often takes place over years or even decades. It is not limited to "rusting" as of iron or changes to the surface of other metals; it applies to all materials.
Metal corrosion causes loss of machanical strength and pollutes media.

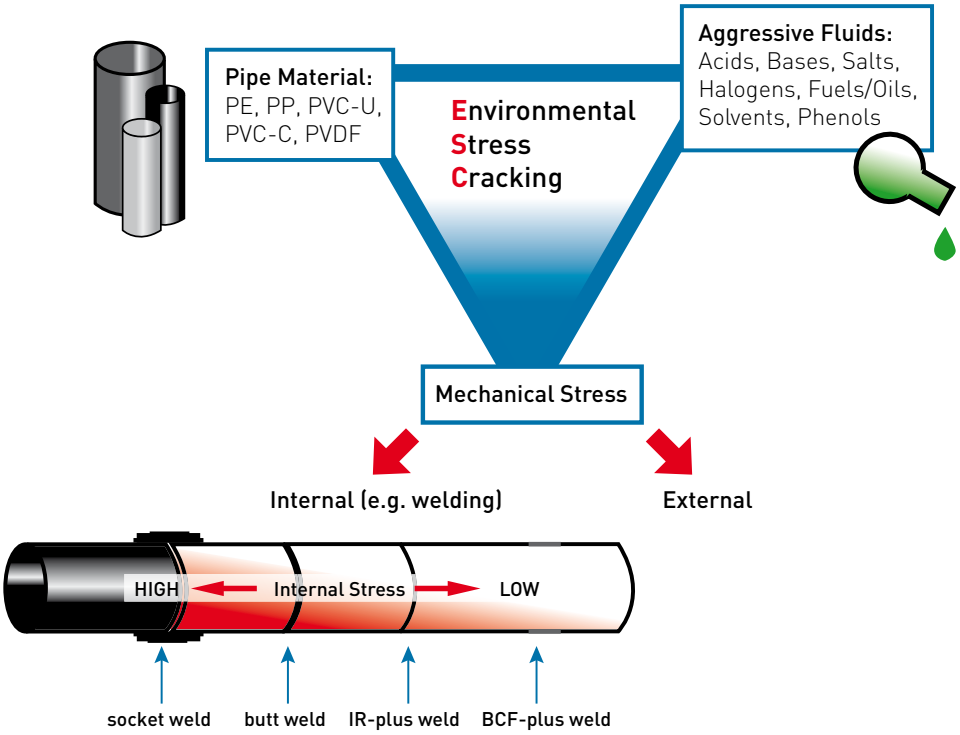
Metal corrosion
In chemistry corrosion is defined as the chemical or electrochemical reaction of a material with substances from the environment. This primarily refers to the redox reaction of metals in connection with water, saline solutions and acids as well as the redox reaction between different metals. In this process a measurable change takes place in the material, resulting in an adverse effect.

How rapidly the corrosion progresses depends on the properties of the respective metals, as well as on the type of medium which is in contact with the metal.
Moisture plays a major role in corrosion. The simplest form of corrosion is the reaction of a metal surface with aggressive media from the environment. For example, sulfur dioxide reacts with air humidity, creating a sulfurous acid and as a result of oxidation with atmospheric oxygen becomes sulfuric acid. Contaminants in the air, such as chlorine or acid vapors, which react directly with many metals, are often found in industrial plants. In contrast to these common redox reactions, there are also more complex redox processes – for example, when metals are damaged by the formation of electrochemical elements or electrolysis.

Plastic corrosion
Plastics are not entirely impervious to corrosion either – considering the fact that the daily operating conditions of piping systems are so diverse and on occasion highly complex.

Corrosion is not only the result of the interaction between the material and the medium which comes into contact with it. The operating conditions, the planning and the installation process are other decisive factors, added to which are environmental effects as well as mechanical and microbiological influence. Coupled with the time factor – in other words, contact duration and frequency – the actual specifications for the plastic products are determined.
If we delve deeper into the matter, we are able to identify the following types of attack on the material.

- **A genuine chemical attack** occurs when the formulation ingredients react chemically with the medium. The consequence is a material transformation or a reduction, which increases in turn the susceptibility to erosion.
- **Diffusion/swelling** is defined by similarities in the intermolecular interaction, in the material structure as well as in the respective operating conditions. How easily the medium can penetrate between the molecules is significant.
- **Stress cracking** describes the distress on a plastic component–under the combined effect of a specific corroding material and a critical state of stress. Internal and external tensile stress add up. If the tension exceeds the acceptable limits, there will be damage.



The corrosion of plastics can be largely prevented by selecting the appropriate materials and jointing technology. That is why it is essential to consult a specialist. GF Piping Systems has many years of experience and superior know-how where plastics are concerned. Which materials are used for which applications? Which jointing technology is suitable for the particular material?

In order to answer these questions, it is important to realize that plastic is a material full of surprises. Nearly everything is possible with plastic; the possibilities are immense, but there are some restrictions. And these must be taken into consideration. The more complex the application, the greater the challenges. Such challenges can be overcome with the respective know-how. What fits together? What is mutually exclusive? What are the requirements?

All plastics are not alike

With metal, we know that there are diverse types. With plastic, it is different. We are familiar with the established plastics, such as PVC-U or PE, but do we know that PVC-U is not always the same and neither is PE. This is because the technical properties can vary depending on the manufacturing process and the additives used. The raw material is decisive and there are large variations between the different suppliers. At GF Piping Systems we make sure you receive the best material for your particular application.

Material Selection

Your benefits at a glance

- Corrosion or scaling are no longer a problem.
- Cost savings due to easy and fast installation, early production start, low maintenance costs.
- Highest production safety warranted by the best piping system combined with total transparency in welding process and certified welders.
- Besides our standard products we provide a wide range of specialities.

Please do not hesitate to contact us.

PVC-U
cementable, universal use, very good chemical resistance, easy and fast to connect, basic tools required

product range: 6 - 400 mm
1/8 - 18 inch

PVC-C
cementable, higher temperature resistance than PVC-U

product range: 16 - 225 mm
3/8 - 8 inch

Liner pipes
Dual laminate piping for higher temperature and pressure is widely used in many chemical processes. Our inner liner pipes offer outstanding chemical resistance.

Customizing
Long-term experience and technical know-how in diverse processing techniques make it possible for us to manufacture any design of custom-made product or a complete module.

PE
weldable (electro-, butt-, socket and IR Plus® fusion), long life-time, UV-resistant, flexible and strong at low temperatures, impact resistant

product range: 16 - 630 mm

Our Solutions

Exhaust
Excellent chemical resistance, four corrosion free systems available in PPs, PVC, PVC-C and PVDF product range depending on single exhaust systems

product range: 32 - 500 mm

CONTAIN-IT Plus
double containment system with highest safety, leakage control and easy assembly in accordance with DVS standards

product range: 20/50 up to 225/315
$^{1}/_{2}$ - 8 inch

SYGEF® Standard and SYGEF® Plus
weldable (butt-, socket and IR Plus® fusion, BCF® Plus), outstanding chemical resistance and pressure/temperature range

product range: 16 - 315 mm
$^{3}/_{8}$ - 12 inch

PROGEF® Standard and PROGEF® Natural
weldable (butt-, socket and IR Plus® fusion, BCF® Plus), high impact strength, high rigidity, very good chemical resistance

product range: 16 - 400 mm PROGEF® Standard
$^{1}/_{2}$ - 4 inch PROGEF® Standard
20 - 110 mm PROGEF® Natural

FUSEAL
weldable (electro-fusion) and MJ (mechanical jointing), PP and PVDF chemical resistant properties and temperature capabilities, flame retardant and available in double containment

product range: 1 $^{1}/_{2}$ – 12 inch

Technical Features

Chemical Compatibility at 20° C		Amorphous Thermoplastics		Partially Crystalline Thermoplastics			Steel	
	Group of Chemicals	PVC-U	PVC-C	PE 100	PP	PVDF	Steel 1.4401 316	Steel 1.4301 304
Acids	oxidizing	+	+	-	-	+	o	o
	inorganic	+	+	+	+	+	o	-
	organic	+	o	+	+	+	o	-
Bases	inorganic	+	o	+	+	-	+	+
Salts		+	+	+	+	+	o	o
Halogens	without F	o	o	-	-	+	o	-
Fuels/Oils	aliphatic hydrocarbons	+	+	o	o	+	+	+
	aromatic hydrocarbons	-	-	-	-	+	+	+
Solvents	chlorinated hydrocarbons	-	-	-	-	o	o	o
	ketones	-	-	+	+	o	+	+
	alcoholes	-	-	+	+	+	+	+
	ester	-	-	o	o	o	+	+
	aldehydes	-	-	+	+	-	+	+
Phenols		-	-	+	+	+	+	o

+ good
o fair, please consult us
- poor

The above list of basic suitability is only intended as a guideline and does NOT replace a detailed material recommendation for your application.
This information is based on our experience and state-of-the-art technology. These data are general indicators for orientation, whereas for practical use other factors such as concentration, pressure or jointing technology influence the results. The technical data are not binding and not expressly warranted characteristics of the goods. They are subject to change.

OUR SERVICE — YOUR BENEFIT :
Please contact us for a material recommendation.
Our competent staff is pleased to be of assistance.

Metal corrosion and incrustation:

Physical Properties

Properties		PVC-U	PVC-C	PE 100	PP	PVDF	Unit	Norm
Temperature	°C	0/+60	0/+80	-50/+60	0/+80	-20/+140	°C	-
	°F	+32/+140	+32/+176	-58/+140	+32/+140	-4/+258.8	°F	
Density		1.38	1.5	0.95	0.90 - 0.91	1.78	g/cm³	EN ISO 1183-1
Tensile stress at yield		> 52	> 53	25	31/*25	51	N/mm²	EN ISO 527-1
Flexural modulus		> 2400	-	-	1250 / *900	> 1800	N/mm²	EN ISO 527-1
Tensile modulus	23° C/73.4° F	-	> 2550	900	1300	-	N/mm²	EN ISO 527-1
Charpy notched impact strenght	23° C/73.4° F	> 6	> 6	83	85 / *30.9	> 9	kJ/m²	DIN EN ISO 179/1eA
	0° C/32° F	3	-	-	4.8 / *3.4	> 8	kJ/m²	DIN EN ISO 179/1eA
	-40° C/-40° F	-	-	13	-	-	kJ/m²	DIN EN ISO 179/1eA
Ball identation hardness	132 N	-	-	37	58 / *49	-	MPa	DIN EN ISO 2039-1
	358 N/30 s	> 105	> 110	-	-	> 115	MPa	DIN EN ISO 2039-1
Taber abrasion		250 - 300	250 - 300	60	150 - 200	2.8 - 5.7	mm³/ 10³ cycles	DIN 53754
Heat distortion temperature	HDT A 1.80 MPa	66	> 102	-	-	> 113	°C	ISO 75-2
	HDT B 0,45 MPa	-	-	-	95/*75	-	°C	ISO 75-2
Vicat-softening point		> 76	> 103	-	-	-	°C	ISO 306
Thermal expansion coefficient		0.07 - 0.08	0.06 - 0.07	0.15 - 0.2	0.16 - 0.18	0.12 - 0.18	mm/mK	DIN 53752
Heat conductivity	23° C/73.4° F	0.15	0.15	0.38	0.23	0.19	W/mK	DIN 52612-1
Water absorption	23° C/73.4° F	> 0.1	0.1	0.01 - 0.04	0.1	-	%	DIN 53495
	23° C/24 h 73.4° F	-	-	-	-	> 0.04	%	ISO 62/1
Limiting oxygen index (LOI)		42	60	17.4	19	44	%	ISO 4589

Valve Selection

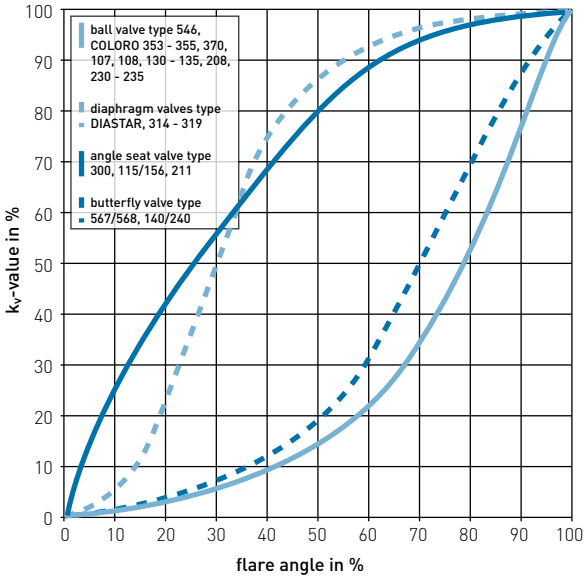
		Ball valve	Diaphragm valve	Butterfly valve	Angle seat valve	Ball check valve	Angle seat check valve	Wafer check valve
Medium transported	free of foreign particles	+	+	+	+	+	+	+
	containing particles, crystallising	o/-	+	+/o	o/-	o/-	o	+/o
	viscous	+	+	+/o	+/o	+	+/o	+/o
	gaseous	+	+	+	o	+	o	+
Operating features	adjustable	+	+	+/o	+	x	x	x
	position indicator	*	*	*	x	x	x	x
	permits use of line pigging	+	-	-	-	-	-	-
	leakproof under vacuum	+	+/o	+/o	o	+/o	o	+/o
	pressure surge causes	(+)	+	(+)	+	o	o	o

\+ recommended
\- not recommended
x not possible/not existing
o conditionally suitable
* existing
(+) recommended only with lever

Valves	Manual	Electric Actuated	Pneumatic Actuated
2-way ball valve	 Type 546	 Type 107 - 135	 Type 230 - 235
3-way ball valve	 Type 343	 Type 175 - 178	 Type 275 - 277
Diaphragm valve	 Type 314 - 319		 DIASTAR Type 028/025/ Eco
Butterfly valves	 Type 567  Type 568	 Type 140 - 142  Type 141 - 142	 Type 240  Type 241 - 242

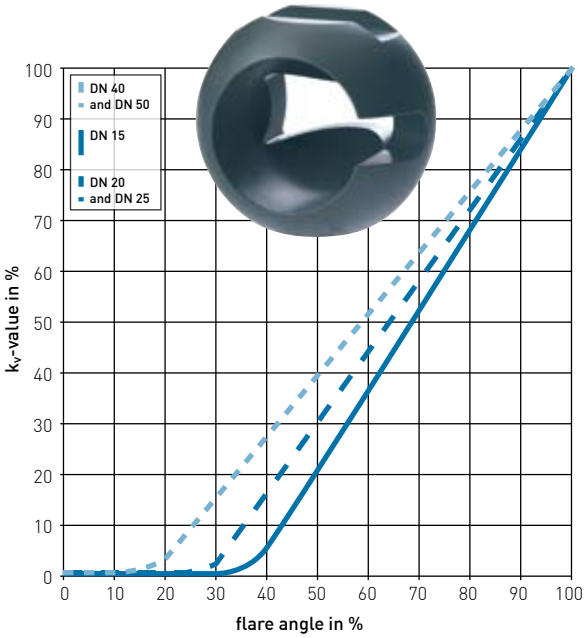
Flow characteristics

of Valves



Flow characteristics

Ball valve 546 linear (Type 110)

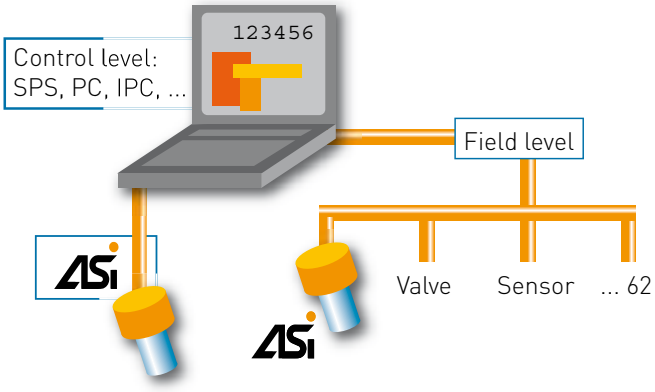


Technical Information

+GF+

Automation with AS-i

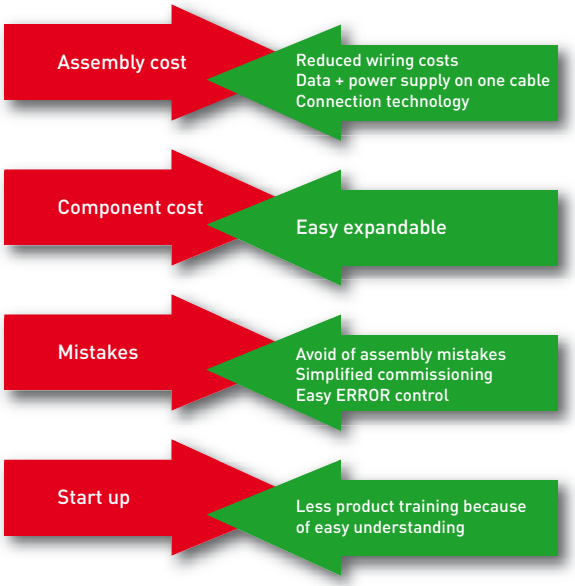
AS-interface Introduction



AS interface (short AS-i) stands for Actuator Sensor Interface and belongs to the standard field buses. It was designed to connect actuators and sensors and therefore it is used only on the bottom level of the control system.

The goal was to replace the parallel wiring. Since 1999, it complies with the international standards EN 50295 and IEC 62026-2.

Typical for the AS-i is the yellow wire as often seen in installations. There is no restriction in the wiring structure. The AS-i is a single master system which means there is only one master in a system. This master polls its configured slaves cyclically and exchanges input and output data.



With AS-i, digital/analog data communication can be easily integrated into the peripheral structures of actuators/sensors. In contrast to the formerly used multicore cables, the amount of wiring is drastically reduced with AS-i because parallel wiring between the individual actuators/sensors with direct connections is no longer necessary. This amounts in cost savings of up to 25 - 35 % depending on the application profile, compared to conventional wiring methods including structural componentized architecture at the hardware level. This therefore represents a highly significant element in cost saving.

AS-i Specifications

There are some AS interface specifications, the most recent is specification 3.0 (since September 2004). The predecessors were 2.0 which can already handle 31 slaves and 2.1 which could only handle 2 slaves.

General system data are

- master-slave principle
- free choice of network structure
- data and power on a two-wire cable
- fail-safe
- communication medium unshielded wire 2 x 1.5 mm²
- signal data and power cable (yellow)
- 4 input/4 output for each slave
- for control cabinet and industrial use, IP67 protection
- penetration technology
- cable range 100 m, with repeater up to 200 m
- electronic slave addressing
- easy installation
- effective error detection and immunity ISO

Measurement and Control

Your benefits at a glance

GF Signet provide fluid handling solutions for every application to our industrial clients.

For almost 40 years, GF Signet has manufactured high-quality liquid flow and analytical measurement equipment.

The GF Signet product line includes sensors and instruments to cover a variety of process controls:

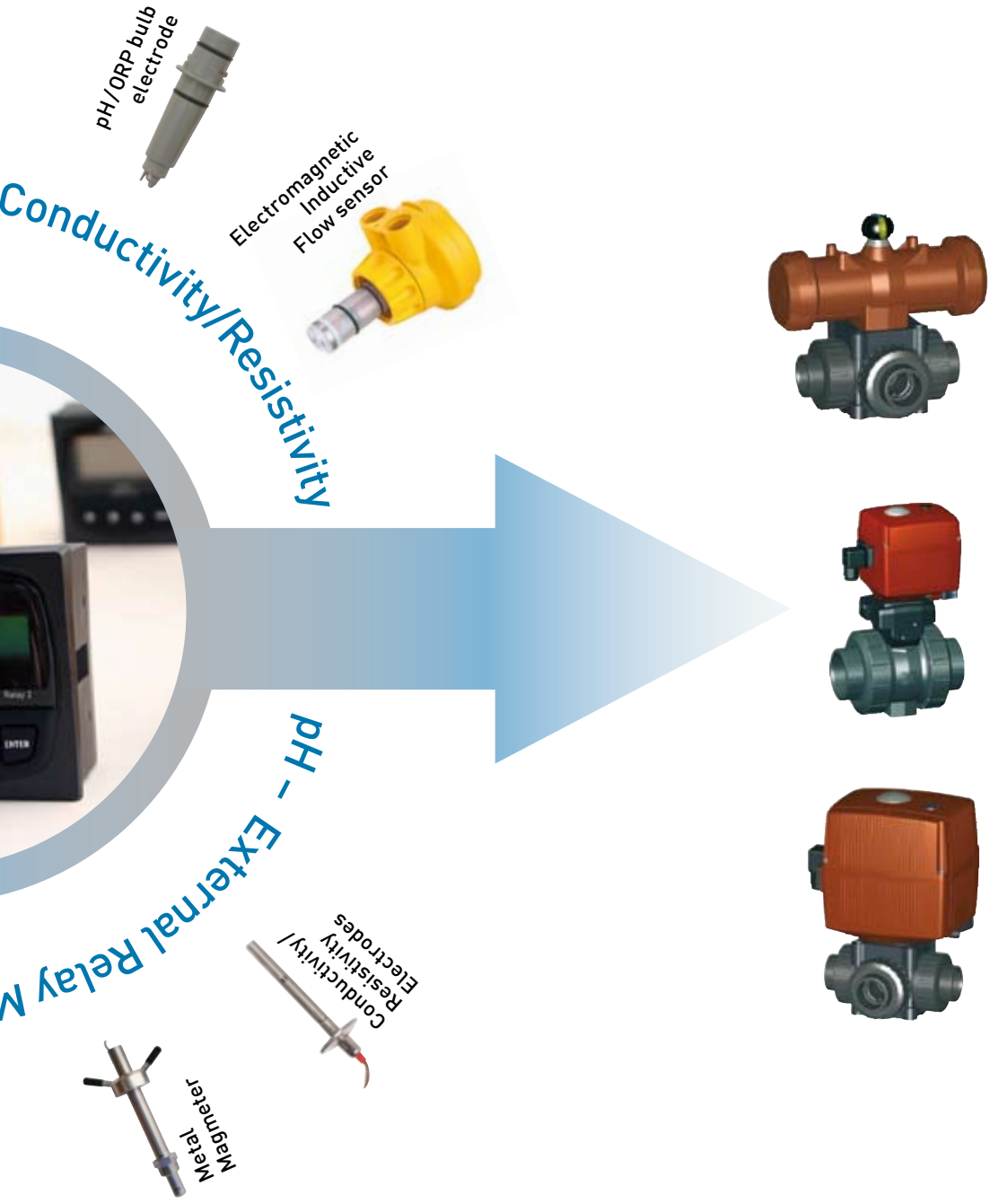
- Flow – paddlewheel, vortex, magmeter,
- pH/ORP
- Conductivity/Resistivity
- Temperature
- Pressure
- Level
- Multi-Parameter

The GF Signet product line also features trademarked and patented technologies that lead the fluid measurement industry. Committed to product excellence, we continue our pursuit of quality through innovative, leading-edge technology in flow control and measurement. We're proud of our:

- Award-winning innovative design
- ISO 9001 and 14001 certification
- Comprehensive customer support
- Product quality and reliability
- Easy-to-use instrumentation
- Extensive network of worldwide distributors
- Unmatched delivery

GF Signet 8900 Multi-Parameter Compatibility Overview

Below is an overview of the GF Signet sensors. Further detailed information on GF Signet can be obtained from page 54 ff and your local sales office, or via www.gfsignet.com



Jointing Technologies

Solvent Cementing
simple and reliable jointing – no machine is needed only gap filling cement and a few simple tools

Solvent Cemented
– the fast connection

Electro Fusion
semi-automatic welding with lowest expenditure of human labour

Electro Fusion
– the easy connection

Socket Fusion
fast and easy welding

Socket Fusion
– the strong connection

Butt Fusion
economical welding up to big diameters

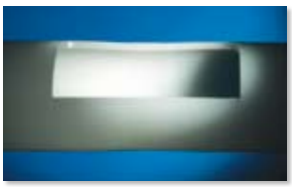
Butt Fusion
– the connection for larger dimensions

IR Plus®
short welding time combined with high traceability of each weld and minimal welding seams

IR Plus® Fusion
– the clean connection

BCF® Plus
best welding quality with highest welding factor and no welding seams

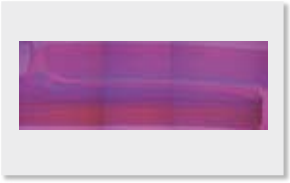
BCF® Plus Fusion
– the smooth connection



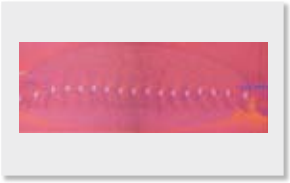
Mechanical Joints
fast exchangeability, detachable, customising, transitions and washing are just a few of the benefits

Mechanical Joints
– the fast connection

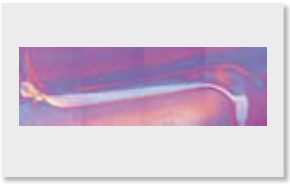
For the most suitable piping system the best jointing technology is needed to install reliable and high quality piping systems. GF Piping Systems has developed it for you.



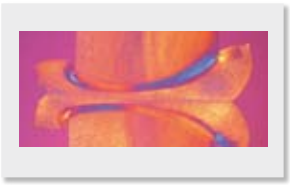
Chemical and pressure resistance identical to the pipe



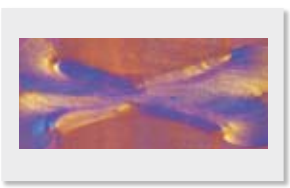
Ideal for in-place-fusion, standard connection for the outer double containment pipe; not for copper corroding media (copper wire)



Simple to install, heavy duty connection, no reduction of the clear pipe opening by beads (important for small diameters)



Universal connection for all sizes; big bead may affect pressure loss and deposits



Heating without contact, no contamination, smallest weld beads

No beads and crevices, no deposits almost stress free

Seals for any application available, connection to tanks, pumps, metal piping

Pipes

	Outside-Diameter d		6	8	10	12	16	20	25	32	40	50	63	75
PE 100	SDR 41/ 33	PN 4 / 5	-	-	-	-	-	-	-	-	-	x	x	x
	SDR 17,6	PN 9,6	-	-	-	-	-	-	x	x	x	x	x	x
	SDR 11	PN 16	-	-	-	-	x	x	x	x	x	x	x	x
	SDR 7,4	PN 25	-	-	x	x	x	x	x	-	-	-	-	-
PP-s	Air conditioning		-	-	-	-	-	-	-	x	x	x	x	x
PROGEF® Standard	SDR 41 / 33 / 26 + Air conditioning	PN 2,5 / 3,2 / 4	-	-	-	-	-	-	-	-	-	x	x	x
	SDR 17,6	PN 6	-	-	-	-	-	-	x	x	x	x	x	x
	SDR 11	PN 10	-	-	-	-	x	x	x	x	x	x	x	x
	SDR 7,4	PN 16	-	-	-	-	x	x	x	-	-		-	-
	SDR 6	PN 20	-	-	x	x	-	-	-	-	-	-	-	-
PROGEF® Natural	SDR 17,6 / 11	PN 6/10	-	-	-	-	-	x	x	x	x	x	x	x
PROGEF® Plus	SDR 11	PN 10	-	-	-	-	-	x	x	x	x	x	x	x
PVC-U grey	Air conditioning		-	-	-	-	-	-	-	-	-	-	-	-
	SDR 51	PN 4	-	-	-	-	-	-	-	-	-	-	-	x
	SDR 34,3	PN 6	-	-	-	-	-	-	-	-	-	x	x	x
	SDR 21	PN 10	-	-	-	-	-	-	x	x	x	x	x	x
	SDR 13,5	PN 16	-	-	-	x	x	x	x	x	x	x	x	x
	SDR 9	PN 25	x	x	x	x	x	x	x	x	x	x	x	x
PVC-U troisdorfred	SDR 51	PN 4	-	-	-	-	-	-	-	-	-	-	-	-
	SDR 34,3	PN 6	-	-	-	-	-	-	-	-	-	-	-	-
	SDR 21	PN 10	-	-	-	-	-	-	-	x	x	x	x	x
	SDR 13,5	PN 16	-	-	-	x	-	x	x	x	x	x	x	x
	SDR 9	PN 25	-	-	x	-	x	x	-	x	x	x	x	-
PVC-U transparent	SDR 51 / 34,3 + special	PN 4/6	-	-	-	-	-	-	-	-	-	x	x	x
	SDR 21	PN 10	-	-	-	-	-	-	x	x	x	x	x	x
	SDR 13,5	PN 16	-	-	-	x	x	x	x	x	x	x	x	-
	SDR 9	PN 25	x	x	x	x	-	-	-	-	-	-	-	-
PVC-C	SDR 21	PN 10	-	-	-	-	-	-	-	-	-	-	-	x
	SDR 13,6	PN 16	-	-	-	-	-	-	-	x	x	x	x	x
	SDR 9	PN 25	-	-	-	-	x	x	x	x	x	x	x	-
PVC-L-HP food aproved	SDR 13,5	PN 16	-	-	-	-	-	-	-	x	x	x	x	x
	SDR 9	PN 25	-	-	-	-	x	x	x	-	-	-	-	-
SY-GEF® Standard	SDR 13,5	PN 16	-	-	-	-	-	x	x	x	x	x	x	x
	SDR 21	PN 10	-	-	-	-	-	-	-	-	-	-	-	-
SY-GEF® Plus	SDR 13,5	PN 16	-	-	-	-	-	x	x	x	x	x	x	x
	SDR 21	PN 10	-	-	-	-	-	-	-	-	-	-	-	-
SY-GEF® Exhaust		-ΔPmax 1500 Pa	-	-	-	-	-	-	-	-	-	-	-	x

90	110	125	140	160	180	200	210	225	250	260	280	315	355	400	450	500	560	600
x	x	x	x	x	x	x	-	x	x	-	-	x	x	x	x	x	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	x	x	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	x	x	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	x	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	x	x	-	-	-	-
-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	x
x	x	x	x	x	x	x	-	x	x	-	x	x	-	-	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	-	x	x	x	-	-	-	-
x	x	x	x	x	x	x	-	x	x	-	x	x	-	-	-	-	-	-
x	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	x	-	-	-	-	-	-	-	x	-	-	-	-	-	-
-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	x	-	x	x	-	-	-	x	-	-	-	-	-	-	-	-	-	-
x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
x	x	x	x	x	-	x	-	x	x	-	x	x	-	x	-	x	-	-
x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
x	x	-	x	x	-	-	-	x	-	-	-	x	-	-	-	-	-	-
x	x	-	-	x	-	-	-	-	-	-	-	-		-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-
x	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-
x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-		-
x	x	x	x	x	x	x	x	x	-	-	-	-	-	-	-	-	-	-
x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	-	-
x	x	-	-	x	-	x	-	-	x	-	-	x	-	x	-	-	-	-

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Product Range

Fittings

Socket Systems

Material		Dimension	Pressure range PN		 Bend 90°	 Elbow 90°	 Angle 45°	 T 90°	 Socket	 Double Nipple	 Reducer	 Endcap	 Trans-mission Fitting	 Union
	PVC-U	d6 - 400			x	x	x	x	x	x	x	x	x	x
	PVC-C	d20 - 225			x	x	x	x	x		x	x	x	x
	PROGEF® Standard	d20 - 630		PN6										
				PN10		x	x	x	x	x	x	x	x	x
	PE	d20 - 630		PN6										
				PN10		x	x	x	x		x	x	x	
	SYGEF® Standard	d20 - 315		PN16		x	x	x	x		x	x	x	x
				PN10										
	SYGEF® Plus	d20 - 315		PN16										
				PN10										
	ABS	d20 - 315		PN16										
				PN10	x	x	x	x	x	x	x	x	x	
	COOL-FIT™	d25 - 225			x		x	x		x	x			

Butt Fusion Systems

Material		Dimension	Pressure range PN		 Bend 90°	 Elbow 90°	 Angle 45°	 T 90°		 T 90 ° red	 Reducer	 Endcap	 Transition Fitting	 Union
	PROGEF® Standard	d20 - 400	SDR11		x	x	x	x		x	x	x	x	x
			SDR17		x	x	x	x		x	x	x		x
	PROGEF® Natural	d20 - 110	SDR11			x	x	x			x		x	x
			SDR17		x		x	x			x			
	PROGEF® Plus	d20 - 315	S5/SDR11		x	x	x	x		x	x	x		x
	PE	d20 - 400	S5/SDR11		x	x	x	x		x	x	x	x	x
			S8.3/SDR17.6		x		x	x		x	x	x		x
	SYGEF® Standard	d20 - 225		PN16	x	x	x	x		x	x		x	x
				PN10	x		x	x		x	x			
	SYGEF® Plus	d20 - 315		PN16	x	x	x	x		x	x	x	x	x
				PN10	x			x		x	x			

Tank Adapter	Adaptor Unions-R	Union End
	x	x
	x	x
x		
	x	x
x		
	x	x
		x
	x	x

Flange Adapter	Sanitary Adaptor
x	
x	
x	x
x	
x	
x	
x	
x	
x	
x	x
x	

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Product Range

Valves-Manual

		 Labo-ratory Ball Valve	 Mete-ring Ball Valve	 3-Way Ball Valve		 Ball Valve	 Diaphragm Valve				 Butterfly Valve							
Document No. GMST				5368	5368	5677 6000	5348	5348	5348		5552	5109	5109		8241 5885	8241 5885	8258 6001	8258 6001
Type		322/324	323	343 Plus	343 vertical	546	314	315	317	319	367	037-M	037-G	038-M	567	567	568	568
Material	PVC-U	x	x○▲■	x○▲■	x○▲■	x○▲■	x○▲■	x■	x○▲■		x○▲■				x○▲■	x○▲■	x○	x○
	PVC-C			x○▲		x○▲■	x	x○	x○▲■						x○▲■	x○▲■	x○	x○
	ABS			x■		x■	x■	x■	x○▲■						x○▲■	x○▲■	x○	x○
	PROGEF® Standard		x	x○		x○▲■	x	x	x○▲■	x	x○▲				x○▲■	x○▲■	x○	x○
	PROGEF® Natural							x		x								
	SYGEF® Standard			x○		x○▲	x	x	x○▲■						x○▲■	x○▲■	x○	x○
	SYGEF® Plus						x	x	x○▲■	x								
	Metall											x○▲■	x○▲■	x○				
	Sillicon free	x	x	x		x	x	x	x	x PP-H	x				x	x	x	x
	Oil free					x	x	x	x	x					x	x	x	x
Sealing material	EPDM	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	NBR						x	x	x	◆		◆	◆	◆				
	FPM	x	x	x	x	x	x	x	x	◆	x	x	x	x	x	x	x	x
	FFPM					x (PVDF)												
	FPM/PTFE coated														◆	◆	◆	◆
	PTFE/EPDM	x	x	x	x	x	x	x	x	x								
	CSM						x	x	x	◆		◆	◆	◆				
	Other						◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆
Dimension DN		6-8	10-15	10-50	10-50	10-100	15-50	15-50	15-150	15-15/ 100-50	250-300	50-300	50-300	50-300	50-300*	50-300*	50-300*	50-300*
Pressure range PN		10	10	10	10	PVC-U/ PVC-C/ PVDF 16 PP 10 ABS 10	10	10	10	10	6-4	10	10	10	10	10	10	10

* available 250 and 300 at November 2007

x	metric standard	▲	JIS
		■	BS
○	ASTM/ANSI	◆	on request

 Ball check Valve	 Wafer check valve	 Angle seat check Valve	 Angle seat Valve	 Line Strainer	 Throttle Valve	 Gauge Guard	 Filler and Brea-ther	Filler
5668					5558	5558	5558	5558
360	369	303	300	305	V 251	Z 700 Z 701	V 91	V 95
x○▲■	x○	x○	x	x○	x	x	x	x
x○		◆	◆	x				
x		x	◆	x				
x	x	x		x	x	x	x	x
x	x	x			x	x	x	x
x	◆	x	x	x				
x	◆							
x	x	x	x	x	x		x	
x	x	x	x	x	x		x	x
						x		
10-80	32-300	10-80	10-80	15-80	10-50	25-32	10-80	10-80
10-16	6	10	10	10	10	10	10	10

Product Range

Product Range

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Automation-Actuated Valves

		 Electric ball valve							 Electric 3-way ball valve				 Pneumatic ball valve				
Document No. GMST		8259	8259	8259	8259	8259	8259	8259	5804	5804	5804	5804	5749	5749	5749	5749	5749
Type		107	130	131	132	133	134	135	175	176	177	178	230	231	232	233	234
Material	PVC-U	x○▲■	x			○	■	▲	x○▲■			x	x			○	■
	PVC-C	x○▲	x			○	■	▲	x○				x			○	■
	ABS	x■	x				■		x				x				■
	PROGEF® Standard	x○▲		x				▲		x○				x			
	PROGEF® Natural																
	SYGEF® Standard	x▲			x			▲			x○				x		
	SYGEF® Plus																
	Oil free																
Sealing material	EPDM	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓	✓
	PTFE																
	PP-H																
	FPM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	FPM/PTFE coated																
	CSM																
	Other																
Dimension DN		10-50	10-100	10-100	10-50	10-100	10-100	10-100	10-50	10-50	10-50	10-50	10-100	10-100	10-50	10-100	10-100
Pressure range PN		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

✓	available	▲	JIS
x	metric standard	■	BS
○	ASTM/ANSI	◆	on request

	 Pneumatic 3-way ball valve			   Diastar diaphragm valve		
5749	5804	5804	5804	5398/5917	5398 5917	5398 5917
235	275	276	277	025 and 028	025	Eco
▲	x○▲■			x○▲■	x○▲	x○▲■
▲	x○			x○▲■	xx▲	x○
	x			x○▲■	x○▲	x■
▲		x○		x○▲■	x○▲	x○▲■
				x		
▲			x○	x○▲■	x○▲	
				x○▲■	x○▲	
				x x x	x	x
✓	✓	✓		x x x x x ◆	x	x
				x x x x x x	x	
				◆ ◆ ◆	◆	
✓	✓	✓	✓	◆ ◆ ◆ ◆ ◆	◆	◆
				◆ ◆ ◆	◆	◆
				◆ ◆ ◆	◆	◆
10-100	10-50	10-50	10-50	DN15- DN50	65-150	15-50
10	10	10	10	10	6-10	6

Product Range

Automation-Actuated Valves

		 Electric butterfly valve			 Pneumatic butterfly valve			 Electric butterfly valve	 Electric butterfly valve	 Pneumatic butterfly valve	 Pneumatic butterfly valve	 Pneumatic angle seat valve	 Solenoid valve					
Document No. GMST		5109	5109	5109	5109	5109	5109	8241 5885	6001 8258	8241 5885	8258 6001							
Type		035	037	038	036	037	038	140	141 ISO 142 ANSI	240	241 ISO 242 ANSI	211	157	160	161	165	166	
Material	PVC-U	x○▲			x○▲			x○▲■	x○	x○▲■	x○	x	x	x	x	x		
	PVC-C							x○▲■	x○	x○▲■	x○							
	ABS							x○▲■	x○	x○▲■	x○							
	PROGEF® Standard	x○▲			x○▲			x○▲■	x○	x○▲■	x○						x	
	PROGEF® Natural																	
	SYGEF® Standard							x○▲■	x○	x○▲■	x○					x	x	
	SYGEF® Plus																	
	Metall		x○▲■	x○		x○▲■	x○											
Sealing material	EPDM	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	PTFE																	
	NBR		◆	◆		x	x											
	FPM	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	FPM/PTFE coated							◆	◆	◆	◆							
	PTFE/EPDM																	
	CSM		◆	◆		◆	◆											
	Other		◆	◆		◆	◆	◆	◆	◆	◆	10-50	x					
Dimension DN		250	50-300	50-300	250-300	50-300	50-300	50-300*	50-200	50-300*	50-200		4-8	10-20	10-20	15-50	3-6	
Pressure range PN		6	10	10	4-6	10	10	10	10	10	10	2-10	0-4	0-3	0-1	0.5-6	0-10	

* available 250 and 300 at November 2007

x	metric standard	▲	JIS
		■	BS
○	ASTM/ANSI	◆	on request

										
Pressure reducing valve							Pressure relief valve	Water jet suction pump	Variable area flow meter	
5558	5093	5095	5558	5558	5558	5558	5558	5558	8222	8222
V 82	V 182	V 782	V 786	V86	V 186	V 85	V 185	P 20	SK 10 - SK 41	SK 50 - SK 73
x	x	x	x	x	x	x	x	x	PVCU transparent	PVCU transparent
									Polyamid	Polyamid
									Ploysulfon	Ploysulfon
x	x	x	x	x			x	x		
x	x	x	x	x	x	x	x	x		
x		x	x		x		x		x	x
x	x	x	x	x	x	x	x	x	x	x
	x							x	◆	◆
x		x	x	x	x	x	x			
10-100	10-40	10-40	10-40	65-100	10-50	65-100	10-50	10-80	25-65	10-25
DN 10-50: 10 DN 65-80: 6 DN 100: 4	10	10	DN 10-25: 10 DN 32-40: 4	DN65-80: 6 DN100: 4	10	DN65-80: 6 DN100: 4	10	10	10	10

Pneumatic Actuators

													
		Accessory pneumatic rotary actuators											
Document No. GMST		5950	5950	5950				5650	5920	5398/5917		5398/5917	5398/5917
Type		PA11	PA21	PA30...90	Limit Switches Box AgNi/Au NPN/PNP	Namur connecting plate	Namur mounting bracket	Positioner	Positioner	DIASTAR Type 025	DIASTAR Type028	Type 025	Type Eco
Type of actuator	pneumatic rotary	x	x	x									
	accessory for pneumatic				x	x	x	x	x				
Mode od Operation	FC	x	x	x						x	x	x	x
	FO	x	x	x						x		x	
	DA	x	x	x						x		x	

x	metric standard	▲	JIS
		■	BS
O	ASTM/ANSI	◆	on request

									
	Accessory for pneumatic stroke actuators						Accessory pneumatic actuators		
	5938	5938	5938	5938	5938	5938	5913	5913	5657
ASI Module	Limit Switches ER 52 Ag/Ni/ Au NPN/PNP	Limit Switches ER 55 with Reed Contacts	Namur con-necting plate	Stroke limiter and Manual override	Positioner Type DSR 100	ASI Module Typ Topmatic	Pilot solenoid valves ($^3/_2$ way) PV 94/95	Pilot solenoid valves ($^3/_2$ way or $^5/_2$ way)]	Pilot solenoid valves cluster ($^3/_2$ way and $^5/_2$ way) PV 2000
x	x	x	x	x	x	x	x	x	x

Product Range

Product Range

Electrical Actuators & Accessories

											
		Electrical Actuators									Accessori
Document No. GMST		5907	5907	5907	5907	5907	5907	5907	5907	5907	5907
Type		EA11	EA21	EA31	EA42	Heating element	Fail-Safe Unit	Heating Ele-ment & Fail Safe Unit	Limit Switches AgNi	Limit Switches Au	Limit Switches NPN	Limit Switches PNP	Middle Position
Type of actuator	Electric Rotary	x	x	x	x								
	Accessory for electric					x	x	x	x	x	x	x	x
Voltage	24V =	x	x	x	x					x			
	24V, 50/60Hz	x	x	x	x					x	x	x	
	100-230V, 50-60Hz	x	x	x	x				x				
Power Consumption		22VA at 24V AC/DC	22VA at 24V AC/DC	32VA at 24V AC/DC	40VA at 24V AC/DC				250V AC, 6A	30V DC, 100 mA	10-30V DC, 100 mA	10-30V DC, 100 mA	
		40VA at 100-230V AC	40VA at 100-230V AC	40VA at 100-230V AC	60VA at 100-230V AC								
Torque	Nominal	10 Nm	10 Nm	60 Nm	100 Nm								
	PEAK	20 Nm	20 Nm	120 Nm	250 Nm								
Available Accessories	Heating Element	x	x	x	x	x		x					
	Fail-Safe Unit	x	x	x	x		x	x					
	Limit Switches Ag Ni	x	x	x	x				x				
	Limit Switches Au		x	x	x					x			
	Limit Switches NPN		x	x	x						x		
	Limit Switches PNP		x	x	x							x	
	Intermediate position		x	x	x								x
	Monitorings		x	x	x								
	4...20mA Feedback		x	x	x								
	Positioner		x	x	x								
	Test Adapter	x	x	x	x								

x	metric standard	▲	JIS
		■	BS
O	ASTM/ANSI	◆	on request

								
es electric Actuator								
5907	5907	5907	5907	5907	5907	5907	5907	5907
Monitoring Print	Cycle time extension	Cycle time monitoring	Cycle counter	Current monitoring	4-20mA feedback	Position Indicator	Positioner	Test Adapter
x	x	x	x	x	x	x	x	x
x	x	x	x	x				
					x	x	x	
						x	x	
								x

Product Range

Product Range

GF Signet Flow Sensors

Rotor-X Paddlewheel Flow sensor

Type 515

- 0.3 to 6 m/s
- DN15 to DN900
- Self powered
- Standard mount/wet tap/integral
- FM approved
- PP and PVDF options
- Hastelloy-C and titanium options

Rotor-X Paddlewheel Flow Sensor

Type 2536

- 0.1 to 6 m/s
- DN15 to DN900
- Powered
- Standard mount/wet tap/integral
- FM approved
- PP and PVDF options
- Hastelloy-C and titanium options

Metalex Paddlewheel Flow Sensor

Type 525

- 0.5 to 6 m/s
- DN15 to DN300
- Up to 103 bar
- Up to 149° C
- Stainless steel body
- FM approved

Brass Paddlewheel Flow Sensor

Type 2517

- 0.5 to 6 m/s
- Up to DN900
- Hot-tap version for installation without system shutdown
- FM Approved

Flow Wet-Tap Valve

Type 3519

- Used with 515 or 2536
- Sensor removal without process shut down
- Eliminates process downtime
- Corrosion resistant materials of PVC and SST

Turbine Flow Sensor

Type 2100

- 0.38 to 38 litre/min
- Any mount angle
- Non-magnetic turbine
- Hose or DN15 pipe
- PVDF and ceramic parts

Mini Flow Rotor Sensor

Type 2507

- 400 to 1200 ml/min
- ¼" NPT threads
- PVDF/PTFE/FPM

Magmeter (blind)

Type 2551

- 0.05 to 10 m/s
- DN15 to DN300
- No moving parts
- 4 - 20 mA, digital or frequency output
- Works in dirty fluids
- PP and PVDF options
- Stainless steel, hastelloy-C and titanium options

Paddlewheel Flow Sensor

- 0.1 to 6 m/s
- DN15 to DN200
- Digital, 4 - 20mA flow switch ,
- Pulse outputs, digital (S^3L)
- PP or PVDF

Type 2537

Metal Magmeter

- 0.05 to 10 m/s
- DN50 to DN1200
- No moving parts
- 3 output choices
- Hot-tap version
- Empty pipe detection
- Stainless steel

Type 2552

Stainless Steel High Performance Paddlewheel Flow Sensor

- 0.1 to 6 m/s
- Up to DN900
- Replaceable electronics
- Hot-tap version for installation without system shutdown

Type 2540

Vortex Flow Sensors

- 0.3 – 4 m/s
- DN15 - DN50
- No moving parts
- Piezo detection
- 0-65° C
- PVC/FPM

Type 7000/7001

MicroFlow Rotor Sensor

- 0.11 to 12.11 litre/min
- ¼" NPT or ISO threads for pipe or tubing
- ¼" NPT or ISO thread
- Measures clear and opaque liquids

Type 2000

Magmeter (with Display)

- 0.05 to 10 m/s
- DN15 to DN200
- No moving parts
- Empty pipe detection
- Bi-directional flow
- Various output options and materials

Product Range

GF Signet Flow Instruments

ProPoint Totalizing Flow Monitor

- Permanent and resettable totalizers
- Analogue and digital display
- Use with all Signet flow sensors
- UL and CE

Type 5075

ProPoint Sensor-Powered Flow Monitor

- Self-powered solution
- Up to 60 m from sensor
- Calibration on front panel
- Only for type 515
- UL and CE
- FM Class I, II, III, div I

Type 5090

ProPoint Batch Controller

- Estimates batch time
- Remote start/stop
- Analogue/digital display
- Overrun compensation
- 4 - 20 mA output
- Use with all Signet flow sensors

Type 5600

Multi-Parameter Controller

- 12 - 24 VDC or 85 - 264 VAC
- Up to 6 sensor inputs
- Up to 4 analogue outputs
- Up to 8 relays
- Use with all digital (S^3L) sensors and frequency inputs

Type 8900

GF Signet pH/ORP Sensors

Twist-Lock pH/ORP Electrodes

- Integrated temperature sensor
- Flat/bulb/wet-tap options
- For use with 2720 preamplifier
- General purpose use
- HF and DI options available

Type 2714 - 2717

DryLoc pH and ORP Electrodes

- Integrated temp sensor
- DryLoc connector with gold plated contacts
- Flat/bulb/wet tap options
- For use with 2750/2760 pre-amp
- General purpose use

Type 2754

pH/ORP Wet-Tap Assembly

- Electrode removal without process shutdown
- For use with 2716, 2717, 2720, 2750, 2756, 2757 & 2760

Type 3719

DryLoc pH/ORP Sensor Electronics and Preamplifier

- In-line integral mount & submersible version
- Automatic temp compensation
- Automatic buffer recognition
- 4 to 20 mA outputs available

Type 2750 / 2760

ProPoint Flow Monitor

- Permanent and resettable totalizers
- Analogue/digital display
- 4 - 20 mA output
- Two relays
- Use with all Signet flow sensors

Type 5500

ProcessPro Flow Transmitter

- 4 to 20 mA output(s)
- Relay options
- Resettable totalizers
- Dual input/output available
- Use with all Signet flow sensors
- Panel or field mount options

Type 8550

Battery Powered Flow Totalizer

- Three totalisers
- Field or panel mount
- Digital display
- Auto calibration
- Only for type 515
- Sold as system with sensor or separately

Type 8150

Flow Instruments, Flow integral System

- ProcessPro® instrument with 515 or 2536 sensor
- 12 to 24 VDC powered
- Provides 4 - 20 mA output
- Relay options available

Type 8150

Threaded DryLoc pH/ORP Electrode

- DryLoc connector with gold plated contacts
- Any angle mount
- Mount into ¾" thread
- Quick temperature response
- Rugged for aggressive applications

Type 2774 - 2777

Differential DryLoc pH/ORP Electrodes

- Compatible with other supplier's instruments
- Designed for stability in aggressive process liquids
- Mount in 1" threads
- Quick temperature response

Type 2764 - 2767

GF Signet pH/ORP Instruments

ProPoint pH/ORP Monitors

- Displays pH/temp/mV or ORP/mV
- Dual proportional control
- Two relays
- Scaleable 4 – 20mA output
- 2714-2717, 2754-2757, 2764-2767, 2774-2777

Type 5700

ProcessPro pH/ORP Transmitters

- Displays pH/temp/mV or ORP mV
- Hold and simulate function
- Optional dual output
- Relay and open collector options
- Panel or integral versions

Type 8750

Product Range

GF Signet Conductivity/Resistivity Sensors

Conductivity/Resistivity Electrodes

- In-line or submersible mounting
- 0.055 to 400,000 µS
- SS or titanium as standard
- Hastelloy-C available
- Sanitary tri-clamp versions available
- NIST traceable certificates for USP requirements

Type 2819 - 2823

Conductivity Electrodes

- Dual thread NPT or ISO
- 0.055 to 200,000 µS
- 316 SS electrode, PEEK
- Four cell constants
- In-line or submersible
- Short insertion depth for small fittings

Type 2839 - 2842

GF Signet Conductivity/Resistivity Instruments

ProPoint Conductivity Monitor

- Displays µS, KΩ, MΩ, PPM
- Temp compensation
- 4 - 20 mA output
- Two relays
- 2819 – 2823, 2939 - 2842
- Use with all Signet conductivity sensors

Type 5800CR

ProPoint Salinity Monitor

- Analogue and digital display
- 4 - 20 mA output
- Two relays
- For use with 2822, 2823 & 2842

Type 5900

Multi-Parameter Controller

- 12 - 24 VDC or 85 - 264 VAC
- Up to 6 sensor inputs
- Up to 4 analogue outputs
- Up to 8 relays
- Use with all Signet digital (S³L) sensors and frequency inputs

Type 8900

Conductivity Integral System

- ProcessPro® instrument with 2839 - 2842 sensors
- Provides 4 - 20 mA output
- Relay options available
- 2 or 4 wire power options

Type 8850

GF Signet Temperature, Pressure and Level Sens

Level Sensor

- Level/depth control
- 4-20 mA or digital output
- Submersible installation
- Choice of two pressure ranges
- PVDF/PVC/ceramic
- 10 m cable
- Uses hydrostatic pressure to measure level

Type 2250

Temperature Sensor

- 4-20 mA or digital output
- ¾" NPT connection
- One piece PVDF body
- In-line or submersible
- 4.6 m cable

Type 2350

DryLoc Conductivity Sensor Electronics

Type 2850

- Digital (S3L) or 4 - 20 mA output
- Integral systems with connects to 2839 – 2842 electrodes
- Use any Signet conductivity sensor
- Single and dual channel remote mount versions available

ProcessPro Conductivity Transmitters

Type 8850

- Displays µS, KΩ, MΩ, PPM
- Dual output for both temp and signal
- Relay & open collector
- 2819 - 2823, 2839 - 2842
- Panel or integral mount versions available

ProcessPro Two-Channel Conductivity Controller

Type 8860

- Displays µS, mS, PPM or PPB, KΩ, MΩ, % rejection, difference, ratio, °C or °F
- Two input, three 4-20 mA output, four relays
- For use with all Signet conductivity/resistivity sensors

ors

Pressure Sensor

Type 2450

- 4-20 mA or digital output
- Pressure or level measurement
- PVDF/ceramic
- 0 - 17 bar
- Use 2250 for submersible applications

GF Signet Temperature, Pressure and Level Instr

Process Pro Level Transmitter

- Level units ft, in, m, cm
- Volume units gal, in3, lbs., l, m3, Kg, %
- Specific gravity entry
- Display both level and volume
- 2450 sensor

Type 8250

Process Pro Temperature Transmitter

- Scalable 4 - 20 mA output
- Displays temperature & mA output
- Relay or open collectors
- 2350 sensor

Type 8350

Temperature Integral System

- ProcessPro® instrument with 2350 sensor
- Provides 4 - 20 mA output
- Relay options available
- 2 or 4 wire power opt.

Type 2350

Pressure Integral System

- ProcessPro® instrument with 2450 sensor
- Provides 4 - 20 mA output
- Relay options available
- NEMA 4X/IP65
- 2 or 4 wire power option
- Use for tank mount level measurements

Type 2450

Other GF Signet Products

Intrinsic Safety Barriers (FM)

- One step, snap-on 35 mm DIN rail mounting and grounding
- Replaceable 160 mA fuse
- Compatible with 515, 525 and 2517

Type 6400

Switching Power Supplies

- Regulated 24VDC output
- Fused input
- Finger safe terminals
- All monitors and 2550, 2560, 7001 - 7003

Type 7300

pH/ORP System Tester

- Battery powered
- Simulates pH and ORP
- Compatible with 2720, 2750 and 2760 preamp.
- Connects to any Signet pH/ORP instrument

Type 2759

Con./Res. Certification Tools

- Simulates 5 diff. values
- Verifies electronic independent of electrode
- Compatible with all Signet conductivity/resistivity instruments

Type 2830/2850-101

uments

Process Pro Pressure Transmitter

- Scalable 4 - 20 mA output
- Display in psi, bar or KPa
- Relay or open collector
- 2450 sensor

Type 8450

Multi-Parameter Controller

- 12-24VDC or 85-264VAC
- 4 analogue outputs
- Up to 8 relays
- Use with all Signet digital (S^3L) sensors

Type 8900

i-Go Signal Converter

- Connects 4 - 20 mA o/p sensors with Signet transmitters
- Up to two 4 - 20 mA sensors
- 8250, 8350, 8450, 8900

Type 8058

External Relay Modules

- AC and DC powered versions
- External relays controlled by host
- 8250, 8900

Type 8059

Product Range

Jointing Technologies

Welding technique	d Types	16	20	25	32	40	50	63	75	90	110	125	140	160	180
Socket fusion PE, PP, PB, PVDF	MSE 63	■	■	■	■	■	■	■							
	MSE 110	■	■	■	■	■	■	■	■	■	■				
	SG 110		■	■	■	■	■	■	■	■	■				
	SG 160	■	■	■	■	■	■	■	■	■	■				
Butt fusion conventional/hydraulic PROGEF, SYGEF PP/PE/PVDF manual workshop	SSE 120/200/300	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	SG 160				■	■	■	■	■	■	■	■	■	■	
	SG 315									■	■	■	■	■	■
	GF 160					■	■	■	■	■	■	■	■	■	
	GF 250								■	■	■	■	■	■	■
	GF 315									■	■	■	■	■	■
	GF 400											■	■	■	■
Butt fusion conventional/hydraulic PROGEF, SYGEF PP/PE/PVDF workshop	GF 500														
	GF 630														
	GF 800														
	GF 1000														
	GF 1200														
	WM 315									■	■	■	■	■	■
	WM 500														
	WM 630														
	WM 1200														
BCF SYGEF PROGEF® Natural	BCF® Plus		■	■	■	■	■	■	■	■	■				
IR SYGEF PROGEF® Natural PE100	IR-63 Plus®		■	■	■	■	■	■							
	IR-225 Plus®							■	■	■	■	■	■	■	■
	IR-315 Plus®														
Electro fusion tools PE100/80	HWSG PB	■	■	■	■	■	■	■							
	MSA	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Ce-menting PVC-U PVC-C ABS	Tangit	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Dytex	■	■	■	■	■	■	■	■	■	■	■			

200	225	250	280	315	355	400	450	500	560	630	710	800	900	1000	1200
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Product Range

GF Piping Systems → worldwide at home

Our sales companies and representatives
ensure local customer support in over 100 countries.

www.piping.georgfischer.com

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