



GREAVES PAKISTAN FLOW METERING EXPERTS



GREAVES PAKISTAN TERMINAL / DEPOT FLOW METERING SYSTEM & INDUSTRIAL DIVISION



FOR OVER **50** YEARS
WE HAVE BEEN A PART OF PAKISTAN

a man and a mission

Ghulam Faruque (1899-1992)

The late Ghulam Faruque, Khan Bahadur H.P.K., C.I.E., O.B.E. O.M. (Spain) was a renowned and respected name in the industrial and financial sectors of Pakistan.

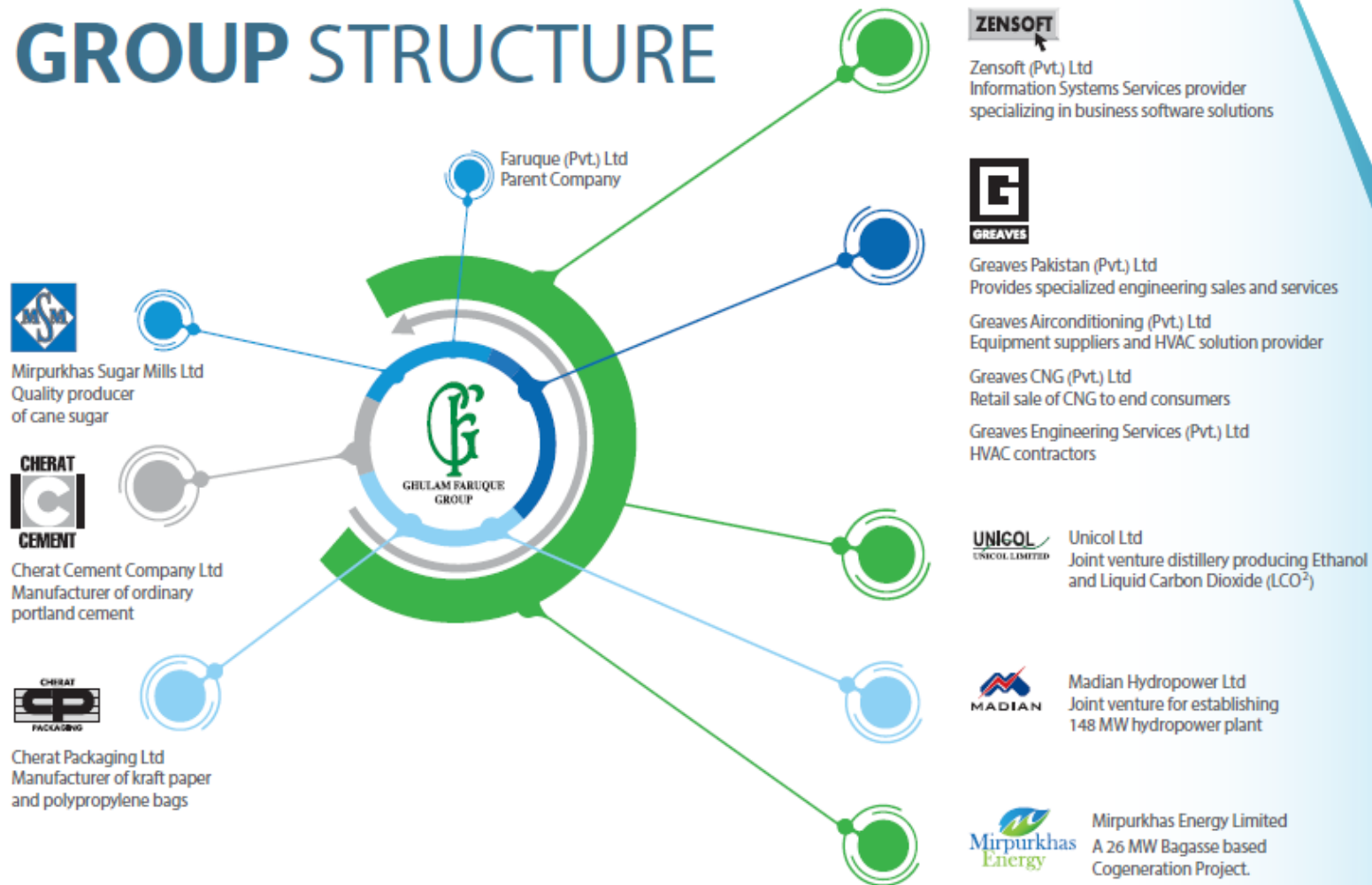
He founded the group and brought it to its present position as one of the premier groups in Pakistan.



**Mr. Shehryar Faruque – Director
Operations of Greaves Pakistan at
the Opening Ceremony of
Polypropylene Plant**



GROUP STRUCTURE



OUR BUSINESS PARTNERS

Here are few of our business partners we are proud to work with.



Liquid Controls is the global market leader in precision measuring systems providing highly engineered and differentiated products used in custody transfer of highly valuable refined fuels and liquids.



ZIPFLUID provides inclusive design, supply and commission packages for road, rail and marine loading arms, marine tanker access and fall prevention systems, quick release couplings, dry disconnect couplings and breakaway couplings.



TOPTECH continues to supply innovative automation and management systems, load rack control equipment, and access control devices to both global and independent companies within the petroleum industry.



OUR BUSINESS PARTNERS

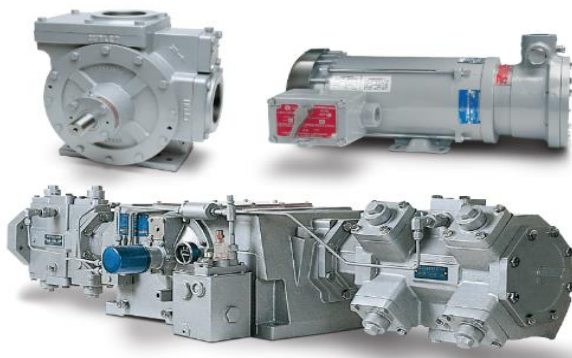
Here are few of our business partners we are proud to work with.



We are leading developer and manufacturer of high quality **safety and security technology** “**Made in Germany**” for the areas of intelligent explosion protection and renewable energy. **Since 1963**, our products guarantee the highest level of safety and security for people, the environment and operating systems.

Corken offers a wide variety of industrial compression and pumping solutions for the process, energy, and transport industries. Applications include autogas filling stations, bulk plant pumps, tank car unloading, delivery truck, transport and many more..

Avery-Hardoll flowmeters are precision made, positive displacement, liquid measuring instruments manufactured by Liquid Controls, a unit of IDEX Corporation. In 2015, Liquid Controls acquired the Avery-Hardoll product line and manufacturers the meters in its Lake Bluff, Illinois manufacturing facility.





OUR BUSINESS PARTNERS

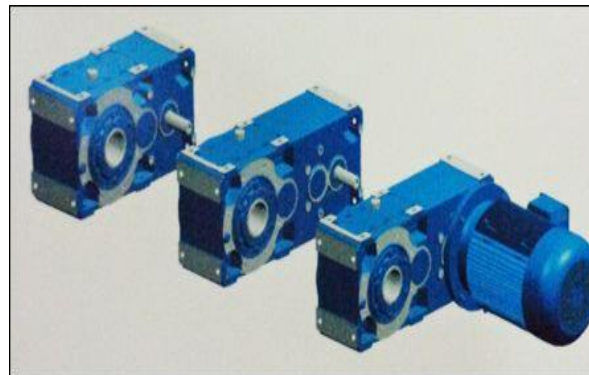
Here are few of our business partners we are proud to work with.



OME is an Italian company specialized in the design and production of electric motors. The company product line up includes Standard Motors for various Industrial applications as well as Explosion Proof Motors for all Hazardous Zones.

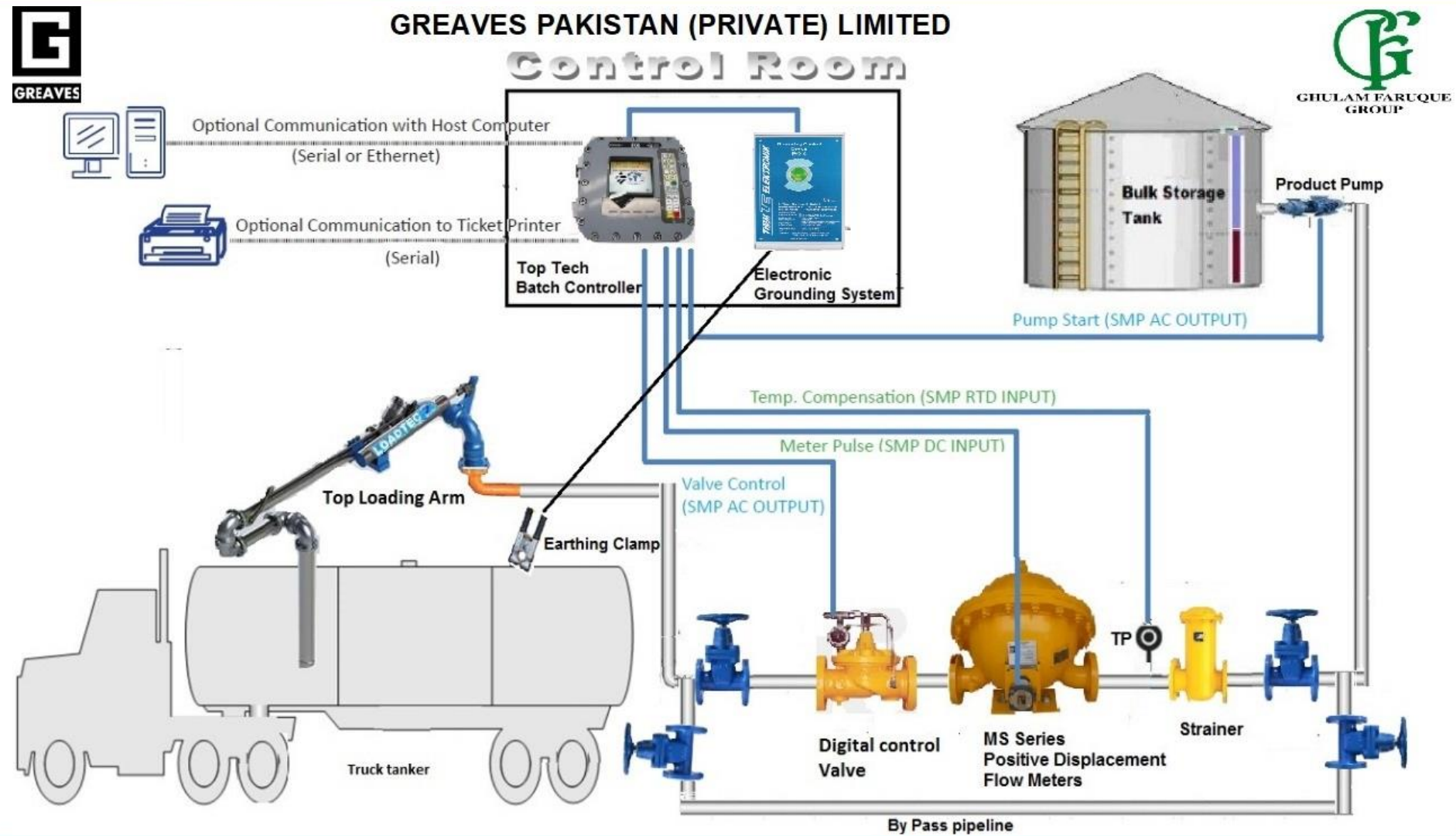


Rossi is one of the leading groups worldwide in the production and trade of Helical and bevel helical gear reducers and gearmotors, planetary, worm and coaxial gear reducers and gearmotors: all of their products have been designed to assure excellent and reliable mechanical performance, resulting in reduced operating costs and long life.



Frecon is high-tech company engaged in industrial automation and control. They are experts in development, production and sales of Variable Frequency Drives for various standard as well as specialized industrial applications.





POSITIVE DISPLACEMENT FLOW METERS

MS Series Steel case



M Series Aluminum



Double Case MS Series Steel case



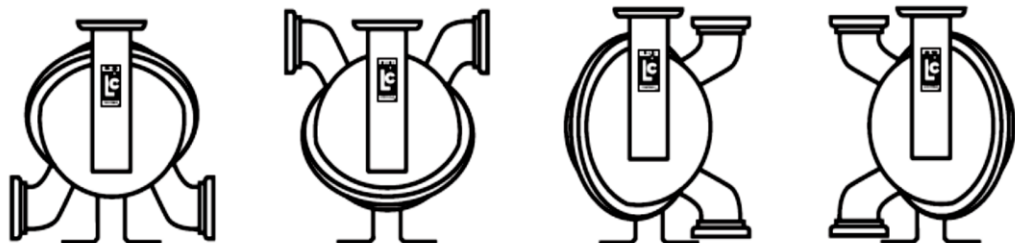
- **Meter Size** : 2", 3", 4", 6" and 8" PD Meters
- **Double Case Design**
- **No metal-to-metal contact inside the measuring chamber**
- **Flow Rates** from 10 – 1000 gpm (38 – 3,785 lpm)
- **Linearity** : capable of $\pm 0.10\%$ or better from max.
- **Repeatability** : Capable of 0.02% or better at any flow rate over entire range
- **Inlet / Outlet Flange Flexibility** : ANSI 150# or 300#
- **Class** 1, 2, 8, 14 and 16



LC meters meet **NTEP (NIST Handbook 44)** and **International Weights and Measures** accuracy requirements as well as U.S. Military specifications.

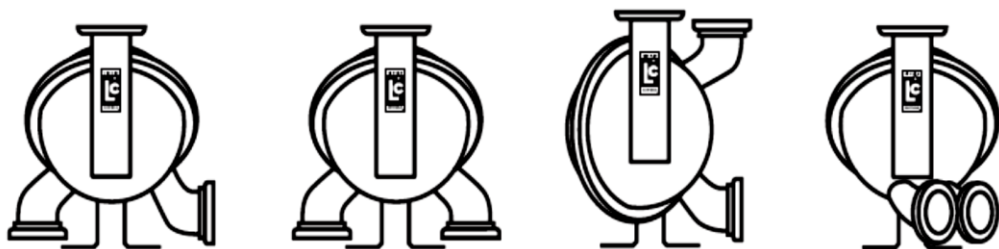
Variety of Option are available for installation

Standard variations for register mounting flange (straight-through flow)



Special variations for flanged spools

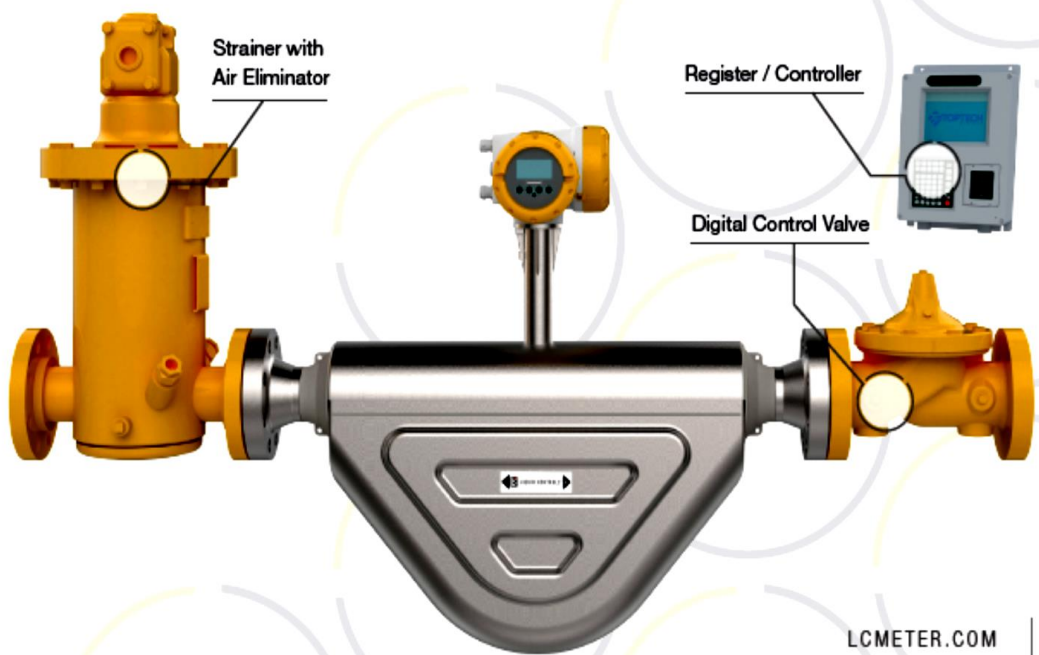
Note: Additional variations are possible (contact factory for details).



CORIOLIS MASS METERING (NEW)

The LCMass® meter expands the product portfolio beyond the world-class positive displacement and turbine metering technologies. The addition of LCMass® to the Liquid Controls metering and accessory portfolio continues to assure that the right solution is provided for any application.

TYPICAL REFINED FUEL MASS METER SOLUTION
 LCMass® 600 with LCI40® Electronic Interface



- Used in mass and density measurement
- Entrained gas management
- Ideal for both gases and liquids
- Low maintenance cost

LCMass® 100:
 Sizes: ½" - 2"
 Accuracy: ±0.15%
 Repeatability: 0.05%

LCMass® 600:
 Sizes: ½" - 4"*
 Accuracy: ±0.05%
 Repeatability: 0.05%

LCMETER.COM | 7

Digital Electro-Hydraulic Set-Stop Valve :

- Two speed controls (opening and closing)
- Two solenoids (N.O. and N.C.)

Specifications

Sizes
 Globe & Angle
 2, 3, 4, 6, and 8" flanged, grooved

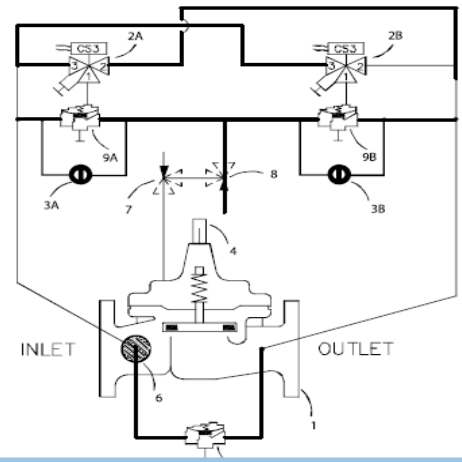
Pressure Ratings
 Ductile Iron: 250-PSI maximum
 Cast Steel: 285-PSI maximum
 Ductile Iron: 400-PSI maximum
 Cast Steel: 400-PSI maximum

Temperature Range
 -40 to +180° F, (light petroleum product)

End Details
Flanged
 Ductile Iron, 150 & 300 ANSI B16.42
 Cast Steel, 150 & 300 ANSI B16.5
Grooved
 Ductile Iron and Cast Steel

Materials of Construction
Body & Cover
 Ductile Iron ASTM A-536
 Cast Steel ASTM A216-WCB
Valve Trim
 Stainless Steel 303
Rubber Parts
 Buna-N® Synthetic rubber
 Viton®

Other materials available on special order



PRESET BATCH CONTROLLER

Toptech Systems' Batch Control solutions offer you complete control over your product. These solutions save time by offering mobile access and remote control, and save money by replacing the traditional card lock, preset, and meter registers. Toptech's team of engineers is always updating the Batch Control products with world class enhancements and new features. Toptech then makes those enhancements and new features available to you at no extra cost.

PRODUCT FEATURES

- Control up to 12 loading arms
- Up to 5 meters and 16 additives per arm
- Internal I/O options
- Scaled for 1-2 arm applications
- Modbus interface with LC mass meters
- Wireless communication options
- Multi-lingual interface
- Color display
- Alphanumeric keypad options
- Integrated card reader options
- Powerful stand-alone operation



Applications:

The SMP is ideally suited for batch loading of liquids, where legally relevant metrology is required. It is used at terminals, bulk plants, ethanol processing facilities, aviation loading and chemical plants. Multi Load II SMP supports loading of gasoline, alcohol, LPG, LNG, fuel oil, chemicals and more.

Temperature Correction

Volume can be corrected to a reference temperature using one of the many temperature correction tables of ASTM-D-1250. The following tables are available. 6A, 6B, 6C, 6D, 24A, 24B, 24E, 53B, 54, 54A, 54B, 54C, 54D, TEC, TEC-ETH. Additional tables can be added upon request.

Pressure Correction

Pressure correction is available for use with compressible products, such as LPG. API tables 11.2.2 and 11.2.2M are provided and require that pressure be measured by Multi Load II SMP, using a 4-20 mA transducer.

Automated Proving

This mode is entered when the Weights and Measures switch is activated. Prior to the proving run, the operator can select a flow rate to prove. Following the proving run, the operator enters the observed volume and temperature. New meter factors are automatically calculated and can be entered by a butt on press when approved by the operator. Alternatively, the operator can skip the calculation process and enter independently calculated meter factors through the operator screen, avoiding the need to enter program mode for data entry.



Rheonics density meters and viscometers bring fluid intelligence and process control to broad range of customer applications.

SRD

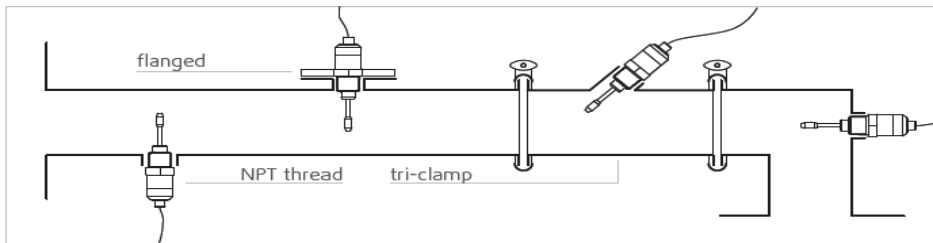
online, real-time fluid density meter with viscosity

- Single instrument for simultaneous process density (specific gravity), viscosity and temperature measurement.
- Compact form-factor for simple installation
- Measures kinematic and dynamic viscosity
- All metal (316L Stainless Steel) construction
- Completely insensitive to mounting conditions
- Operational to 7500 psi (500 bar) and 575°F (300°C)
- Threaded, flanged and sanitary process fittings
- Easy to clean, no maintenance or re-configurations needed

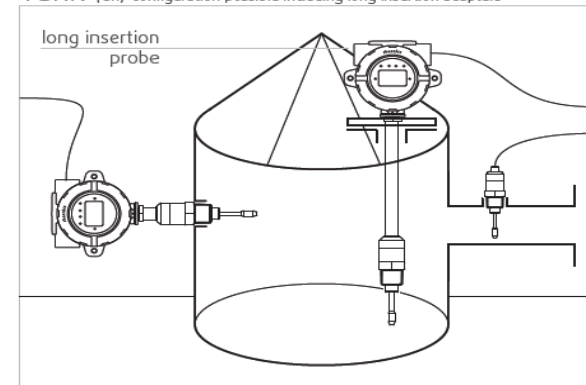


Mounting

Pipe †any configuration possible



Tank †any configuration possible including long insertion adapters





TMS6®

Terminal Management System



Our terminal automation system provides personnel and product access control and security; movement and storage of products including road and industrial Petroleum Products with various other chemicals products. Comprehensive stock control allows deliveries to be balanced against receipts and tank holdings and provides product reconciliation reports and ERP interfaces



Gate Access Before Entry



Bay Allocation



Product Deliveries



BILL OF LADING

ORIGINAL

Emergency Message 1 Emergency Message 2 Emergency Message 3 Emergency Message 4 Emergency Message 5

SHIPMENT OF ORIGIN:
Dan's Terminal
1124 Central Florida Parkway
Longwood FL 32750

EPA# Document 0000000021 Folio: 03/001
TransID: 530 3rd Party Ref: 3333333333 Order: 0000000000
Batch: 1111111111 Contract:
Load Start: 2014-04-06 21:27 Load Stop: 2014-04-06 21:27

SUPPLIER: 0000000001 Default Supply
CUSTOMER: 0000000001 TopTech Systems
ACCOUNT: 0000000001 Test Account 1-1
DESTINATION: 0000000001 Test Destination 1
SHIP TO: 1124 Florida Central Parkway
Orlando FL 32817

CARRIER: 00000001 Test Carrier
DRIVER: 00000001 Test Driver
TRUCK: 0000000001
COMMENTS: comment
comment

SCAC:

BOX MESSAGE: Bill of Lading Message 1 abcdefghijklmno Bill of Lading Message 2 abcdefghijklmno Bill of Lading Message 3 abcdefghijklmno Bill of Lading Message 4 abcdefghijklmno Bill of Lading Message 5 abcdefghijklmno
Carrier certifies that the container supplied for this shipment meets applicable Department of Transportation specification and is a proper container for the transportation of the products described below.

Product Summary

Hazardous Materials Description	Gross	Net
Default Hazard Message Line 1 (H2000000) Default Hazard Message Line 2 (H2000000) Default Hazard	5600	5385
Default Hazard Message Line 1 (H2000001) Default Hazard Message Line 2 (H2000001) Default Hazard	10300	9864
TOTALS(LTR)	15900	15249



Monitoring and Control



Gate Access Before Exit

Product Deliver Receipt



Top Loading Arm articulated self-supported pipeline used To transfer fluids from depots to load railway and trucks Through the manhole on the top of tanker variable reach type allows wider loading coverage



Components description (standard version)

- Right-hand layout, bottom inlet, ANSI 150 inlet flange
- Double swivel style F-50 in 42CrMo4 carbon steel + FKM seals
- Compression spring balancing unit
- Loading valve in aluminum alloy, stay-open type
- Loading valve remote control lever
- Main pipe in aluminum alloy
- Intermediate swivel style F-40 in aluminum alloy+ FKM
- Intermediate pipe in aluminum alloy
- Drop pipe swivel style F-40 in aluminum alloy + FKM seals
- Drop pipe in aluminum alloy
- Drip bucket in aluminum alloy

Standards and regulations

- 94/9/EC Directive (ATEX)
- 2006/42/EC Directive (Machinery)
- 97/23/EC Directive (PED)
- API - ASTM - ANSI - TTMA standards

Technical specifications

- **Design temperature:**
-15 / +65°C
- **Design pressure:** 10 bar
- **Test pressure:** 15 bar
- **Max flow rate (*):**

2"	▶	830 l/min
3"	▶	1900 l/min
4"	▶	2400 l/min
6"	▶	3500 l/min

GROUNDING CONTROL DEVICE EKX-4 SAFE DISCHARGE OF ELECTROSTATIC CHARGES

During loading and unloading of **tank trucks, silo trucks, railway wagons or tank containers** with inflammable liquids or solids, an **explosive gas and dust atmosphere** may arise – a single spark can be sufficient to initiate an explosion. To prevent this, the occurring **electrostatic charges must be discharged safely**.

PRODUCT BENEFITS

- **Prevents manipulation** due to object recognition (by measuring the impedance)
- **Automatic diagnosis system** continuously self-monitors all safety-related functions
- **Simple device configuration** (e.g. “road tank truck“, “railway tank wagon“)
- Possibility to **connect longer cables** (up to 30 m) due to cable compensation
- **Opening the housing** under voltage is permissible - thanks to intelligent explosion protection (IEPC)



Advantage Over other Grounding system

When these three conditions are positive, then give the permissive to batch controller for loading the system

1. The EKX-4 knows it is connected to a road tanker.
2. The EKX-4 knows it is connected to a verified earth ground.
3. Check the Value of Resistance between Earth pit to clamp

***While other grounding system is checking only connectivity between truck and ground controller that's why our Grounding system is True Grounding system**



TECHNICAL SPECIFICATIONS

Type of protection:

according to ATEX 2014/34/EU:

Ex II 2 G – Ex eb q [ib] IIC T4 Gb

Ex II 2 D – Ex t [ibD] IIIC T80°C Db IP65

Power supply:

230 V AC \pm 10 %, 50 Hz, approx. 10 VA

Control outputs:

2 potential-free closing contacts

1 change-over contact | 1 NAMUR-output

Operating temperature: - 30 °C up to + 60 °C

Approvals: ATEX, EAC Ex, CQST, SIL 2



Specifications

Category	Standard Motors
Frame size (mm)	H 56 - H 710
Voltage	Multi voltages
Poles	2-4-6-8-10-12-14-16
Cooling System	IC 411, IC 416, IC 611
Hz	50 Hz - 60Hz
Sectors	Air Treatment, Cement, Food Industries, Power Plants, Steel Mill, Sugar Plant, Water System Purification, water treatment and desalination, Wind Power Generation
Fields Applications	Bending Rolls, Boylers, Compressors, Conveyors, Crusher – Shredders, Die Casting Machine, Fans and Blowers, Forging Presses, Heating and air conditioning HVAC, Injection Moduling Machine, Machine Tools, Pumps, Rolling Mill & Steel Plant Equipment, Sheet Metal Presses, Turbines



Standard Motors IE2 High Efficiency

- High efficiency
- Reliability
- Long life
- Easy Manutenction



The ATEX certification of the OMEX explosion proof motor

The OMEX series includes motors built according to the **ATEX** directive, which classifies the equipment based on the level of protection guaranteed in dangerous areas. The term ATEX (explosive atmosphere) indicates a mixture of air and fuel that, in particular conditions of temperature and pressure and if properly triggered, can cause an explosion (deflagration or detonation). The fuel can be gas or dust. The **explosion proof electric motor** of the OMEX series, also called **ATEX motor**, are designed to be used where maximum safety against fires and explosions must be guaranteed (IEC 60079-0: 2013).

ATEX refers to two European directives that regulate explosive atmospheres:

ATEX Directive 2014/34 / EU concerning equipment and protection systems installed in potentially explosive atmospheres.

Directive 99/92 / EC which prescribes the minimum protection requirements for the safety and health of workers exposed to the risks of explosive atmospheres.

The **explosion proof motors** of the OMEX series have the ATEX certificates Ex d IIB and IIC T4.



CALIBRATING A FLOW METER USING MOBILE PROVING TANK

The Proving Tank is towed and positioned in the loading bay or in an appropriate position, in order to direct the flow meter's liquid easily into the proving tank neck tube using a rubber hose. The tank is levelled correctly with the help of screw jacks provided. The bottom discharge valves along with the drain valve are closed. Procedure for proving the flow meter is now exactly the same as that for a fixed Proving Tank.



SPECIFICATIONS

- Type : Open volumetric prover
- Capacity : 3000 and 5000 litres
- Gauge Glass : $\pm 0.1\%$ of tank capacity Resolution
- Displacement : $\pm 0.5\%$ of tank capacity Tube Volume
- Thermometers : Mercury in steel 0°C to 50°C
- Trolley : 2 tons, 4 tons and 6 tons capacity (for Mobile Proving Tank)

FOAM STORAGE TANK (SS/MS)

- ❖ STORAGE CAPACITY 150 to 17500 Ltrs.
- ❖ MATERIAL OF STAINLESS STEEL
- ❖ CONSTRUCTION (304 or 316)
- ❖ EXPANSION DOME 2% of Total Tank Capacity
- ❖ FINISH RED RAL 3000 or NATURAL FINISH



Liquid Control - USA Bulk Metering System for Truck Loading Application at Terminals / Depots



LC Metering installation – Florence Italy



LC Metering installation – Florence Italy



LC Metering installation – USA



LC Metering installation – France

Liquid Controls Metering Equipment at Petroleum Terminal





List of Some Major Clients in Pakistan



Liquid Controls World Wide Reference List



Thank you