



SYED BHAIS (PVT) LIMITED



Single Phase Watthour Meter

Type F-72 Family of Meters

For the ultimate in Metering Performance in any Environment



F-72 P Meter

Technological expertise and nearly half a century of experience have made SYED BHAIS the largest manufacturer of electricity meters in Pakistan. Our experience in the manufacture of reliable high-quality watt-hour meters includes a complete range of residential and industrial metering products for the electric utility industry.

A progressive design and development policy together with the discerning use of new materials and advance manufacturing technologies ensure that our meters have a high standard of reliability, durability, sustained accuracy and a long service life. With combined efforts of our R&D laboratories and system-oriented experts, we have continuously introduced innovations in metering. In the early nineties SYED BHAIS were the first to introduce single phase F-72 family of meters completely housed in transparent polycarbonate security boxes for protection against un-authorized access to meter components or tampering.

This kind of metering expertise and long-term experience has gone into every SYED BHAIS watt-hour meter, millions of which are already in use throughout Pakistan and various other South American, African and Asian countries.

Avoid lost revenues and keep expenses down with advanced, long-life F-72 family of meters

- Magnetic Suspension
- Precise calibration and high accuracy
- Corrosion Resistance Construction
- Fully Sealed and weather-Proof design
- Extended Load range
- Longer term calibration stability
- Tamper resistant meter cover



Figure 1. F-72P Meter

Single Phase Meters – Type F-72 Family of Meters

For accurate, reliable and economical bottom-connected applications

DESCRIPTION

Single phase induction Watt-hour meter, Model F-72 family of meters. They are accuracy class 2.0 meters for single phase 2 wire or single phase 3 wire balanced circuit use, having cyclometer type register, magnetic suspension bearings and anti-reverse device (if required).

The F-72 family of meters is available in both 50 and 60 Hz designs, 120 or 240 volts and in maximum current ratings of 40, 60 and 100 amps.

Backed by General Electric USA technology and manufacturing expertise for over 15 years, Syed Bhais F-72 family of meters single phase meter incorporates many parts which are special developments of GE and no other manufacturer offers similar features without additional cost.

The main feature making the F-72 family of meter superior in reliability and economy is its magnetic suspension bearing system. The magnetic suspension bearings assure a longer meter life without sacrificing accuracy. Its friction free operation keeps the disk turning freely and accurately for over long time resulting in substantial saving for the utility.

Other features that make F-72 family of meters the most advanced single phase meter include specially selected metals and insulating materials which provide long term corrosion resistance for critical parts inside the meter.

All of these material selections backed by professional skills & strict quality control in manufacturing, result in a watt-hour meter with high calibration stability during its entire service life. Moreover, the use of meter cover made of high grade transparent polycarbonate or Glass makes all the working parts clearly visible from outside.

Beside maintaining a very high standard of workmanship during manufacture of these meters Syed Bhais have developed strict quality control procedures based on internationally accepted methods, to ensure production meeting the customer's specifications and relevant IEC, BS or ANSI standards.

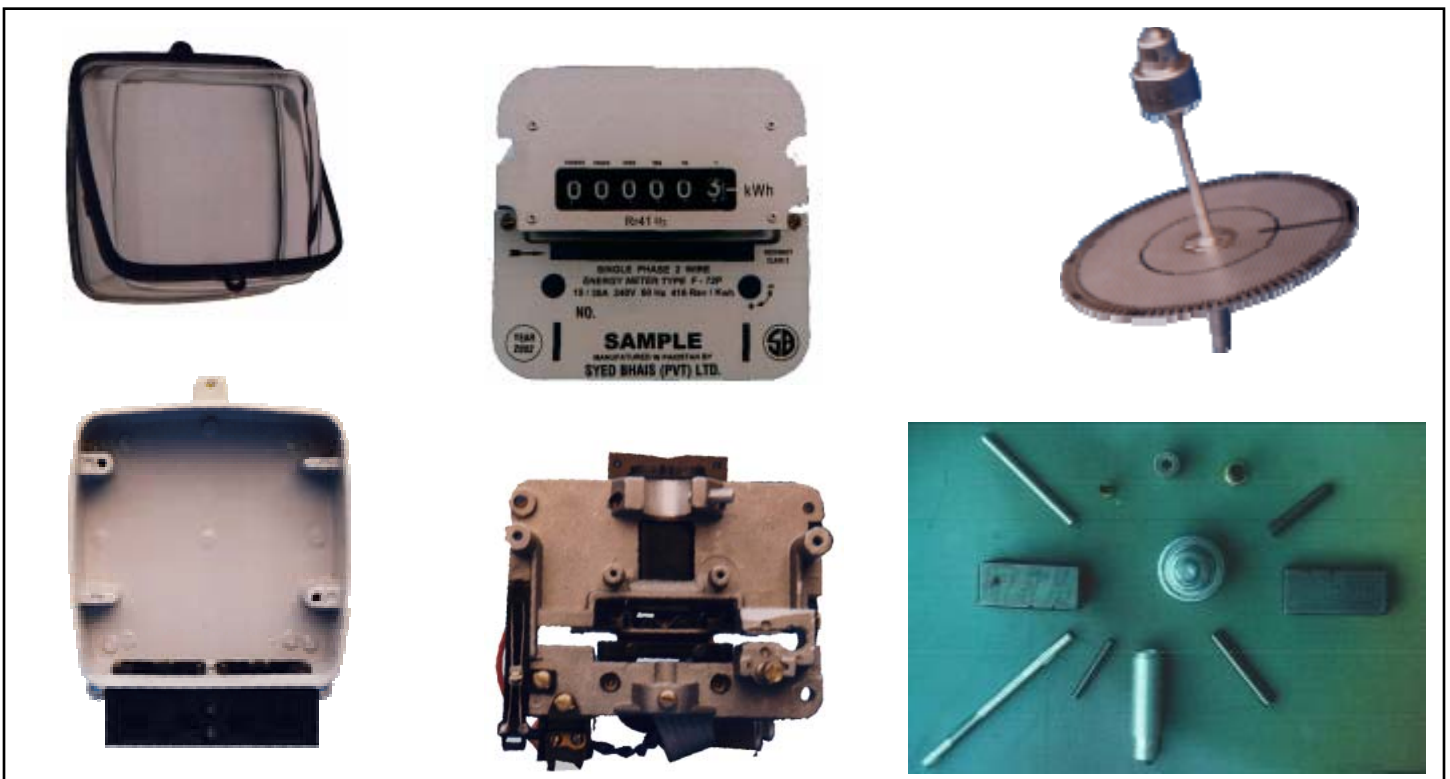


Figure 2. F-72P Meter Components

CONSTRUCTION FEATURES

SYED BHAIS single phase watt-hour meter offer many features not found in most of the other bottom-connected watt-hour meters.

- **Meter Cover**

F-72 family of meter can be supplied with either a tempered high resistant glass or a polycarbonate cover. Both provides full visibility and superior protection against tampering or damage.

- **Meter Base**

Rigid base made of aluminum silicon die - cast alloy, designed for optimal deformation and corrosion resistance.

Molded phenolic base is also available on request.

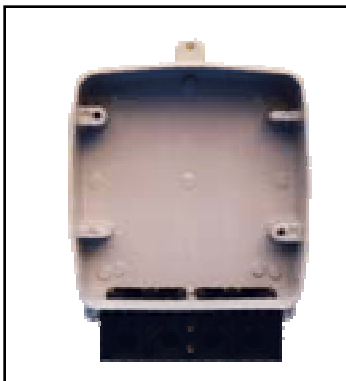


Figure 3. F-72 Aluminum Base

- **Meter Frame**

All functional components of F-72 family of meter are fastened to a die-cast aluminum frame in a manner to assure long lasting mechanical stability that will add years to the life of your meter. Broken Magnets including temperature compensation are cast into the frame for providing long term stability. A feature unique to F-72 family of meters.

- **Terminal Block**

The Terminal Block is made of high quality bakelite material. The dielectric strength test is carried out on 100% of production and terminal blocks which withstand 2.5KV for one minute,

The terminal blades made of Brass / Copper are solidly welded to the current coil ends to ensure dependable operation under high load conditions. Both types of terminals are available type for copper cables and pressure plate type for Aluminum cables.

- **Terminal Cover**

The terminal cover can be either short or extended in accordance with client's specifications. The meter wiring diagram is attached inside. The terminal cover is sealed by means of a rubber gasket for better protection against dust.

Driving Element or Stator

Specially treated potential and current stator assemblies offer dependable service and high corrosion resistance.

- **Potential and Current Cores:**

Mounted on templates and riveted in order to assure perfect alignment and rigidity of the assembly and coated with electrophoretic paint against oxidation.

- **Potential Coils**

Potential coils are encapsulated in Nylon; resulting in a coil which is completely moistureproof and well protected against high voltage surges. The design of potential coil is in two parts to reduce voltage stress and increase life under extreme service conditions. Resulting for a wattless of less than 0.8W.

- **Current Coils**

The current coil wound from large cross-section copper strip and heavily insulated by special epoxy resin ensures its high overload capacity. Laminated cores making the potential and current stators are specially electrocoated to resist corrosion.

According to the type of application, current coils can be supplied for max. currents of 20, 30, 40, 60 or 100 amp.

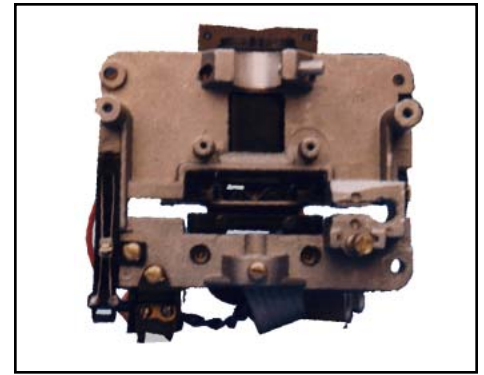


Figure 4. F-72P Meter Frame

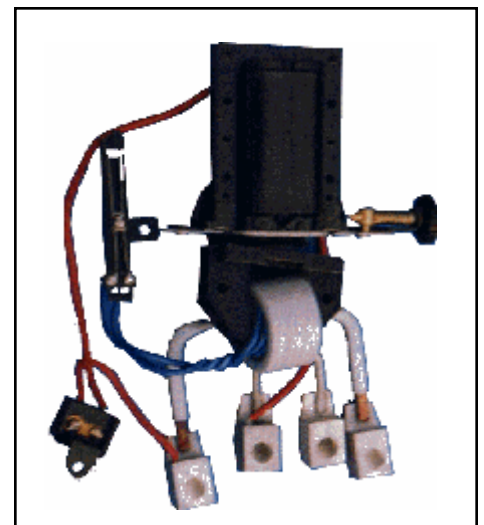


Figure 5. F-72 P Pot Coil (1 phase 2 wire)

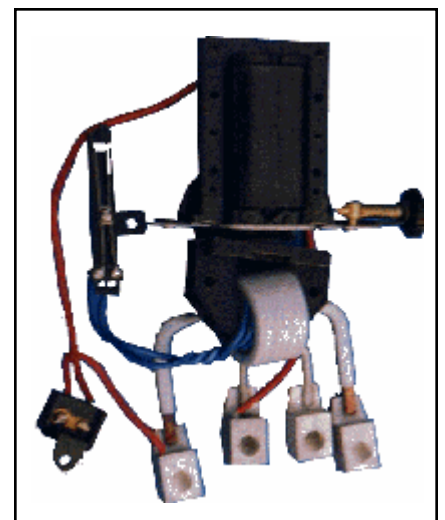


Figure 6. F-72P Pot Coil (1 phase 3 wire)

Rotor As Driving

Composed of an aluminum shaft and a disc made of stamped and machined highly conductive aluminum. Peripheral markings are provided on the disc for stroboscopic calibration. Two diametrically opposed anti-creep holes prevent potential creep of the disc and can be used for photoelectric calibration as well.

Magnetic Suspension Bearings

Magnetic suspension yields low cost, maintenance free meter life under extreme conditions.

In the magnetic suspension bearings, interaction of two concentric, magnets, keeps the meter rotor in suspension making the rotating assembly virtually friction free. Because of no friction, there are no wear & tear effects in the moving parts and stability of calibration is ensured for longer period.

Because of the magnetic suspension principle, the meter accuracy is least affected even if the meter is installed slightly tilted.

More than 70 million GE meters utilizing this bearing design are already in service around the World: without a single reported magnetic suspension failure.

Register

Five or six digit registers are available with different digit sizes as required. Regular bi-directional Register, unidirectional register and jumping digits register can also be made available on.

The register consists of a small number of parts engineered in such a way to provide long life operation at very low friction levels and to reduce the possibility of handling damage. The aluminum front plate enhances the general appearance and allows easy reading.



Figure.7 F-72 P Damping Disc

While assembling the meter, the rotor to register gear meshing is done using high resolution TV cameras, so that accurate and dependable energy registration with minimum register loading on the meter is possible.

results in precise positioning of magnets to give long term stability of calibration.

A top quality class I temperature compensator is also die cast into the frame along with the magnets. After this compensation the meter calibration remains steady under a wide range of ambient temperature variations.

Braking Magnet

The F-72 family of meter's retarding magnets, made of Alnico VI material are embedded in the aluminum-silicon die - cast frame to resist demagnetization due to lightning and switching surges. This also

Micro-metric screw adjustment is provided for full load calibration which affects the retarding magnetic field across the main air gap by damping principle.

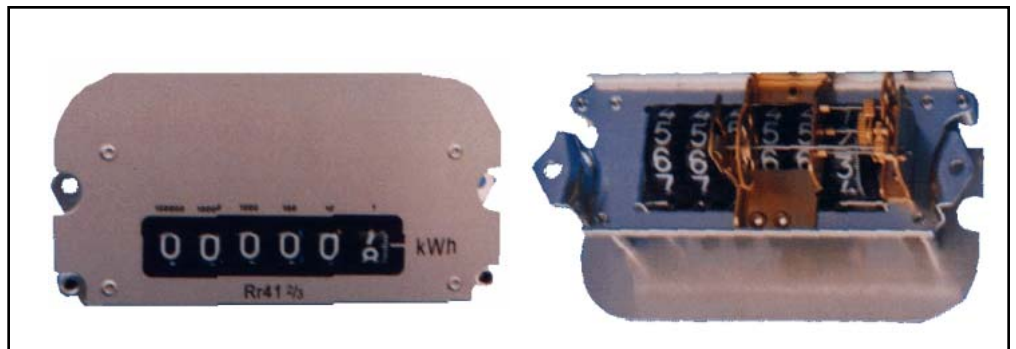


Figure 8. F-72Ph Register



Figure 8. Polycarbonate Security Box

The F-72 family of meters outperforms all other single-phase, bottom connected meters ...every time.

With the F-72 family of meters
You get:

EXTRA PRECISE CALIBRATION AND HIGHER ACCURACY.

Accuracy is maintained at 2% from less than 1.5 to 60 amperes in fact, the meters are factory calibrated to less than 0.5% error at 1 to 10 amperes.

EXTENDED LOAD RANGE.

The meter maintains class accuracy up to 600% of the rated current which means a 10 amp meter can remain in use even as the load grows up to 60 Amps and it is not necessary for the utility to stock large inventories of meters with different current ratings.

LONGER TERM CALIBRATION STABILITY

The F-72 family of meter's integral die cast retarding magnet and frame construction, friction free suspension bearing system, rigid stator, frame and general construction result in a meter whose calibration remains stable for many years.

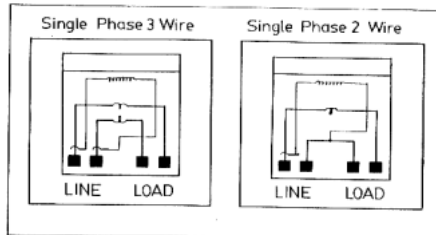
Polycarbonate security box

A mechanism developed by SYED BHAIS for the first time to provide superior meter protection against tampering or damage.

The security box is made from shatterproof clear transparent polycarbonate material and consists of two parts – Upper & Lower. Both the parts are ultrasonically welded from the points of contact in such a way that the complete meter resides in the box.

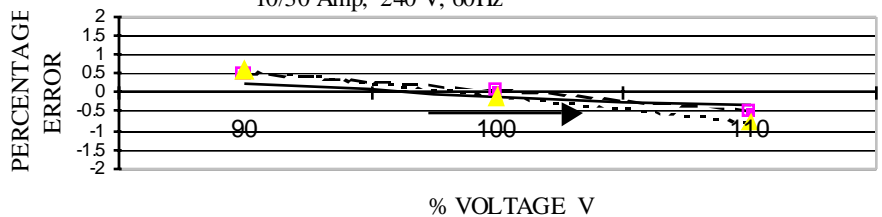
Security box is optional and can be ordered on request.

Connection Diagrams



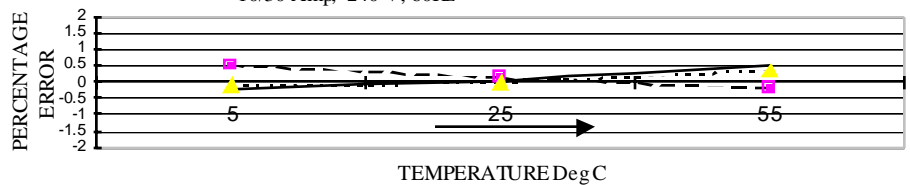
INFLUENCE OF VOLTAGE VARIATION

FOR METER TYPE F-72Ph
10/30 Amp, 240 V, 60Hz



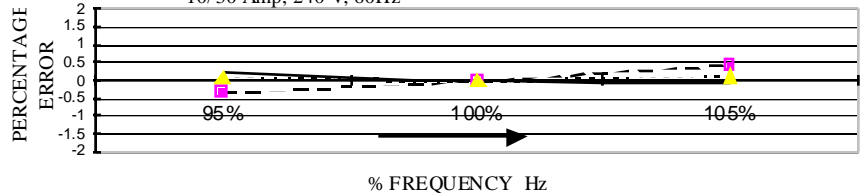
INFLUENCE OF TEMPERATURE VARIATION

FOR METER TYPE F-72Ph
10/30 Amp, 240 V, 60Hz



INFLUENCE OF FREQUENCY VARIATION

FOR METER TYPE F-72Ph
10/30 Amp, 240 V, 60Hz



INFLUENCE OF CURRENT VARIATION

FOR METER TYPE F-72Ph
10/30 Amp, 240 V, 60Hz

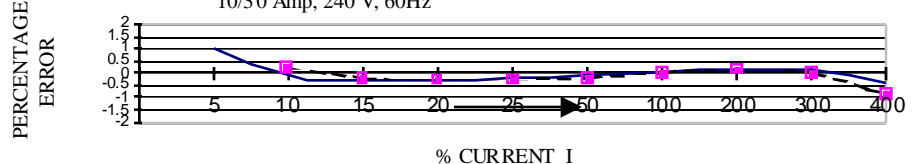


Figure 10. F-72PTypical performance characteristics

TECHNICAL INFORMATION

Electrical Characteristics

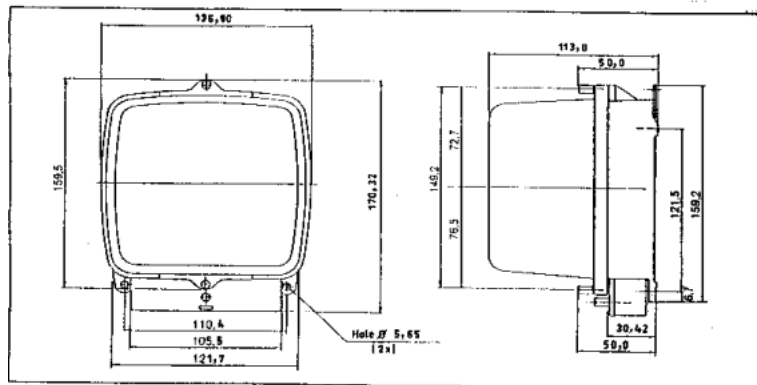
Description	Unit	F-72 Family of Meters
Reference Voltage Un	V	120, 220, 240
Reference Frequency	Hz	50 and 60
Number of element		1
Number of wires		2 or 3
Basic – Max current, Ib (Imax)	Amps	10 (30), 5(20), 10(40), 10(60), 20(80), 15(100)
Self Consumption:		
- Voltage circuit losses	W	<0.8
- Current Circuit losses at Ib	VA	0.13
Full load Torque (10/40)	mgF	83
Full load speed	rpm	16 2/3
Starting current	% of Ib	0.5
No load operation	% of Un	80% to 120% of Un
Dielectric Test	KV	2.5 KV, 1min
Impulse voltage (1.2/50)	KV	6
Range of Adjustments (Standard, special requirements can be accommodated)		
- Full Load	%	±4.0%
- Light Load		±4.0%
- Lag Load		±1.0%

Mechanical Characteristics

Description	F-72P
Bearing Type	Magnetic
Register Type	Cyclometer
Weight of meter	Approx 1.9 Kg
Weight of rotor	19.55 gms
External dimensions	237 x 137 x 113
Meter Cover	Glass
Meter Base	Alluminum Silicon Alloy
Terminal Block	Pressure molded Bakelite
Terminal Block Cover	Galv anized and dichromate-treated steal
Terminal Sequence	P N N P or P P N N

Dimensions

Metal Base & Polycarbonate Cover



SALIENT FEATURES MAKING F-72 Family of Meters – A HIGHLY DEPENDABLE WATTHOUR METER

- Magnetic suspension bearing ensure friction free rotation with minimum of fult error.
- Die Cast construction of the braking magnets ensures stability of calibration throughout entire meter service life.
- Twin bobbin coil design ensures improved dielectric strength and low watt losses.
- Specially trated current coil improves over load performance of the meter.
- The meter performs satisfactorily for years and years at light loads because of low friction in register and bearing assemblies.
- Our F-72 family of meters has successfully completed all the type tests at Næional and International independent Laboratories Pakistan as per IEC specifications.



For details please contact
SYED BHAIS (PVT) LIMITED
200-FEROZEPUR ROAD, P.O. BOX 483
LAHORE-54600, PAKISTAN
PHONES: (+92-42) 7589197-99 (3 LINES) 7577901 & 7560198
FAX: (+92-42) 7588199 & 7596203 TELEX: 44957 SANAM PK
Info@syed-bhais.com
