

Supply and installation of Small Scale Irrigation Technologies (SSIT) Service Providers selection criteria under Second Sustainable Agricultural Intensification and Food Security Project (SAIP II)

The Small-Scale Irrigation Technology (SSIT) program has been developed by the Government of Rwanda (GoR) as a subsidy scheme to promote the widespread use of demand-driven, affordable, and quick-fix irrigation technologies. Farmers can easily acquire complete irrigation kits including either portable diesel/petrol pump units, pipes, solar-driven irrigation units, dam sheets, etc. The kits are used by farmers to irrigate from 0.5 ha to 10 ha of their land.

To facilitate the adoption of SSIT, the Rwandan government, through initiatives in the Ministry of Agriculture and Animal Resources (MINAGRI) and the Rwanda Agricultural and Animal Resources Development Board (RAB), offers subsidies of 50% and 75% depending on the type of irrigation technology and land size. However, a special consideration for cooperative/group-based SSIT under SAIP II project offers a subsidy of 90%. This financial support is particularly important for smallholder farmers affected by climate change. By encouraging the adoption of innovative and climate-resilient practices, the government seeks to address the challenges faced by the agricultural sector while fostering long-term sustainable development.

I. Selection of the Small Scale Irrigation Technologies (SSIT) Service Providers

The selection will involve onboarding qualified Small-Scale Irrigation Technology (SSIT) service providers who can effectively supply, install, and support irrigation systems for end users. The selection process aims to ensure that service providers have the necessary requirements including; technical expertise, operational capacity, as well as experience to deliver reliable and sustainable irrigation solutions.

Key considerations typically include legal registration and compliance, proven experience in SSIT supply and installation, availability of skilled personnel, quality of equipment and services offered, financial capacity, after-sales support, and ability to provide training and Operation & maintenance services. A transparent and well-defined selection process will help to ensure high-quality service delivery, long-term system performance, and successful implementation of small-scale irrigation interventions.

The following prequalification checklist for Small-Scale Irrigation Service Providers as a screening tool will be used to assess and approve service providers before they are considered to provide the services.

Prequalification Checklist for Small-Scale Irrigation Technology (SSIT) Service providers

Section I - Mandatory Eligibility (Pass/Fail)

| No. | Requirement | Submitted (Yes/No) | Pass/Fail |
|------|---|--------------------|-----------|
| i. | Certificate of domestic company registration | | |
| ii. | A valid online copy of the tax clearance certificate from RRA | | |
| iii. | General experience in supply and installation of irrigation equipment (2+ years) and specific experience in supply and installation of SSIT irrigation equipment proven by 2 Certificates of Good Completion and Contract | | |
| iv. | Manufacturer Authorization for key equipment including Irrigation pumps, solar panels, dam sheets, pipes, and fittings. | | |
| v. | No Debarment by Government and World Bank | | |
| vi. | Warranty Commitment for 12 months | | |

Section II - Technical Capacity

| No. | Criterion | Score | Comments |
|------|--|-------|----------|
| i. | Compliance with Technical Specifications | | |
| ii. | Standards & Certifications for irrigation equipment confirmed by an inspection report issued by RICA | | |
| iii. | Spare Parts Availability commitment | | |
| iv. | Capacity to mobilize at least 2 key staff proven by degree or diploma in irrigation or civil engineering; 1 with 3 years and the other with 1 year of experience in related field (The degree and CV will be provided by the Service Provider within 7 days after contract signature). The documents will be assessed and approved by the beneficiary supported by the project engineer. | | |
| v. | Commitment to not subcontract any of his assignment | | |
| vi. | Commitment to support beneficiary in conducting the field reconnaissance, design and prepare the bill of quantity estimation. The BoQ must be verified and approved by Project Engineer and the beneficiary. | | |

Section III - Financial Capacity

| No. | Criterion | Score | Comments |
|-----|---|-------|----------|
| i. | Promise of credit line of 10 million Rwandan Francs. A confirmed credit line will be provided by the successful service providers before contract signature | | |
| ii. | Commitment to provide the performance security of between 5-10% of the contract amounting equal or | | |

| | | | |
|--|--|--|--|
| | above 20,000,000 Rwf to the beneficiary before contract signature. | | |
|--|--|--|--|

Section IV - After-Sales Service, Training & Environmental, Social and Governance

| No. | Criterion | Score | Comments |
|------|--|-------|----------|
| i. | Commitment of After-Sales Service | | |
| ii. | Training Plan | | |
| iii. | Commitment to adhere to Environmental & Social Practices | | |

Interested SSIT Service providers are requested to submit available documentation/proof in line with the above described requirements.

II. Technical Specifications

Chapter 1: PIPES

1.1 HDPE Pipes

High Density Polyethylene (HDPE) pipes shall be made from virgin polyethylene resin compound qualified for PE 100, Minimum Required Strength (MRS) 10 MPa and hydrostatic design stress σ 8.0 MPa. The Standard Dimension Ratio shall be SDR 13.6, SDR 17 and SDR 26 and the nominal pressure should be respectively PN12.5, PN 10 bar and PN 6 bar.

PE Pipes and fittings shall comply with the listed Standards or equivalent:

- EN 12201:2003 “Plastics piping systems for water supply - Polyethylene (PE)”
- DIN 8074 “Polyethylene (PE) Pipes Dimensions”
- DIN 8075 “Polyethylene (PE) Pipes General Quality Requirements and Testing”
- DIN 19533 “PE HD/LD pressure pipes for water supply, requirements”
- DIN 16963 “Pipe Joint Assemblies and Fittings for High - Density Polyethylene (PE-HD) Pressure Pipes”
- EN 13244:2002 “Plastics piping systems for buried and above-ground pressure systems for water for general purposes, drainage and sewerage. Polyethylene (PE)”.

1.2 PVC Pipes

PVC pipes and fittings shall comply with EN ISO 1452:2009 “Plastic piping systems for water supply. Unplasticised poly (vinyl chloride) (PVC-U)”. Joints shall be of the spigot and socket type. The nominal pressure shall be PN 10 bar and PN 12.5 bar.

The material used in the manufacture of pipes, joints and fittings shall consist substantially of polyvinyl chloride, to which only those additives that are needed to facilitate the manufacture of the polymer and the production of sound and durable pipes of good surface, finish, mechanical strength and opacity may be added. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic hazard, to impair the fabrication or welding properties of the pipes, or to impair the chemical and physical properties of the pipes (in particular long term mechanical and impact strength). PVC content of the pipe shall not be less than 85% and the content shall be achieved by the use of process control method. No rework material shall be used and the dispersion of all ingredients in the material composition shall be uniform. When tested by method 120B of BS 2782 (Methods of Testing Plastics), the deformation temperature of the material under load shall not be lower than 75°C.

- EN ISO 1452-1:2009 Plastics piping systems for water supply - Unplasticized polyvinyl chloride (PVC-U) - Part 1: General.
- EN ISO 1452-1:2009 Plastics piping systems for water supply - Unplasticized polyvinyl chloride (PVC-U) - Part 2: Pipes.
- EN ISO 1452-1:2009 Plastics piping systems for water supply - Unplasticized polyvinyl chloride (PVC-U) - Part 3: Fittings.
- EN 12842:2000 Ductile iron fittings for PVC-U or PE piping systems - Requirements and test methods
- EN 921:1994 Plastics piping systems - Thermoplastics pipes - Determination of resistance to internal pressure at constant temperature.
- EN 744:1995 Plastics piping and ducting systems - Thermoplastics pipes - Test method for resistance to external blows by the round-the-clock method.
- EN 1056:1996 Plastics piping and ducting systems. Plastics pipes and fittings. Method for exposure to direct (natural) weathering
- EN ISO 6259-1:1997 Thermoplastics pipes - Determination of tensile properties - Part 1: General test method.
- DIN 8061: uPVC pipes – Quality requirements - Testing
- DIN 8062 : uPVC pipes – Dimensions
- DIN 8063: Joints and fittings for uPVC pipes – Bents and dimensions.
- DIN 16450: Special fitting for uPVC pipes

1.3 DI pipes and fittings

Ductile iron pipes and fittings shall be in accordance with ISO 2531:2009 or with BS EN 545:2010.

- ISO 2531:2009 Ductile iron pipes, fittings, accessories and their joints for water or gas applications
- BS EN 545:2010 Ductile Iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods.
- BS EN 681-1:1996 Elastomeric seals - Material requirements for pipe joint seals used in water and drainage application. Part 1: Vulcanized rubber.
- BS EN 1092-1:2007 Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN Designated, steel flanges.
- BS EN 14399-2:2005 High strength structural bolting assemblies for preloading. Suitability test for preloading.
- BS EN 1514-1:1997 Flanges and their joints. Dimensions of gaskets for PN-designated flanges. Part 1: Non-metallic flat gasket with or without inserts.
- ISO 9001:2008 Quality Management Systems - Requirements
- ISO 4179:2005 Ductile iron pipes for pressure and non-pressure pipelines Cement mortar lining.
- ISO 6600 :1980 Ductile iron pipes. Centrifugal cement mortar lining. Composition controls for freshly applied mortar.
- ANSI A214 Cement Mortar lining for cast iron and Ductile iron pipes and fittings for water.
- ISO 8179-1:2004: Ductile iron pipes. External zinc-based coating. Metallic Zinc with finishing layer.
- ISO 8179-2:1995: Ductile iron pipes. External zinc-based coating. Zinc rich paint with finishing layer.
- BS 6076:1996: Polymeric film for use as a protective sleeving for buried iron pipes and fittings (for site and factory application)
- ISO 8180:2006: Ductile Iron pipes – polyethylene sleeving for site application.

Dimensions of standard pipes and fittings shall be to ISO 2531 or BS EN 545:2010 unless otherwise shown on the Drawings or required for special purposes. Where pipes or fittings are required in dimensions other than those specified in ISO 2531:1998 or BS EN 545:2010, they shall be of the same classes as listed above and shall be designed for the works proof test pressures specified in Table 10 of ISO 2531 or Table 13 of BS EN 545:2010 for the relevant nominal diameter. Manufacturer's product catalogue, showing dimensions, mass and other details of all standard fittings shall be submitted to the Procuring entity for his approval prior to manufacture. Manufacturer's detailed drawings of all special fittings shall be submitted to the Procuring entity for his approval prior to manufacture. Standard pipe lengths shall comply with Table 3 and 4 of

BS EN 545:2010 for socket and spigot and flanged pipes respectively or Table 2 & 3 of ISO 2531:2009 or their latest revision for socket and spigot pipes, unless otherwise stated.

1.4 Flexible Water Hose Pipe D32

Flexible water hose pipes D32 (internal diameter 25mm) will be used for the delivering the water on the field and each crop. The hose pipes shall be made from PVC reinforced by high tenacity polyester yarn or equivalent materials. The acceptance of use of any type of flexible hose pipes from the Service provider will be decided after the submission of its characteristics and sample to the Procuring entity. The pipes shall be supplied after the written approval of the Procuring entity. The properties of the pipes shall at least cover: light weight, working Pressure/Temperature more than 100psi/23°C, excellent UV resistance, long service life, stretching resistant, anti-wrinkle, non-toxic and environmental friendly. Each piece of the hose pipe should be at least 70m.



Chapter 2: Setting Out

The Service provider shall set out the pipeline alignments in accordance with the Drawings and making any changes the beneficiary and procuring entity may deem necessary. The joint team will confirm also the exact locations of all manholes, valves, air valves, washouts, etc.

The Service provider shall then submit to the procuring entity, at an approved scale, profiles of ground levels, showing the proposed invert levels and the precise location of all manholes, air valves, washout valves etc., for the procuring entity approval.

2.1 Handling and Transport of Pipes and Fittings

The loading, unloading and handling of pipes and fittings shall be carried out using ropes, cranes, lifting beams and slings of approved design, strictly in accordance with the recommendations of the manufacturer and to the approval of SSIT Equipment Evaluation Committee. Particular care shall be taken at all times to avoid damage of any kind. The use of lifting hooks is not permitted, except when used with protection which has been approved by the SAIP Engineer.

Where required internal support shall be provided to all pipes exceeding 800 mm diameter to prevent excessive deformation during handling, transport and storage.

The protective cover, discs, etc. provided by the manufacturer shall not be permanently removed until immediately prior to installation.

When pipes are loaded for road transport, they shall be at all times laid on suitably shaped padded cradles to prevent damage to the coating. When more than one tier of pipes is transported intermediate cradles shall be used. Pillows shall be provided between lashing (ropes, wires or chains, etc.) and the pipes. All cradles and lashings shall be of such widths so as to prevent damage to the coating of the pipe or distortion of the pipes.

All valves shall be handled with care and shall always be transported on timber packing and where possible in the manufacturer's original packing if this is suitable.

In the event of any damage being caused, the Service provider shall be liable for the cost of all repairs or replacements and the costs of any delays. The Procuring entity shall determine whether the damage shall be repaired and if it is to be repaired the manner of such repair, or whether the damaged piece shall be replaced.

2.2 Storage of Pipes and Fittings

The Service provider shall only store pipes, fittings and other materials at places approved by the Procuring entity and shall at all times provide adequate supervision to prevent theft or damage. Any damage incurred due to lack of such supervision or protection, will be the Service provider's responsibility.

Pipes shall not be stacked in storage areas higher than recommended by the manufacturer. The area on which the pipes are to be stacked shall be free draining, the grass or other vegetation shall be kept cut and suitable timber or cradles shall be provided on which the pipes shall be laid. End stops to all stacks shall also be provided.

Fittings and valves shall not be stacked more than one tier high and they shall be supported off the ground by suitable timbers.

Air valves, rubber joint rings, gaskets, bolts and similar fittings and materials shall be kept in approved locked premises and such fittings and materials shall not be distributed to the trench side until immediately prior to laying, fitting, jointing or assembly thereof. All rubber joint rings and gaskets must be stored in a cool damp location and all fittings and materials shall at all times be stored in the shade, under cover and protected from the weather to the satisfaction of the Procuring entity.

The Service provider shall take any necessary precautions to prevent fire in the storage areas and shall provide and maintain fire precautions.

2.3 Stringing of Pipes

Pipes shall be handled and transported in accordance with the Clause 6.10. Protective covering shall not be removed until pipes are to be inspected and laid. Where pipes, fittings or any other materials are laid out on the site adequate personnel shall be provided as required in Clause 6.11.

Pipes shall be laid on suitable pillows or other supports approved by the Procuring entity.

At places where the pipeline routes cross roads, tracks or any other access, and where directed by the Procuring entity, the Service provider shall deposit the pipes so that access to the public is not in any way prohibited. Where the pipeline crosses any field or other place frequented by people or livestock, similar provision shall be made.

The Service provider may be prohibited from using certain roads and other tracks for the purpose of stringing on account of adverse weather conditions. No extra cost he may incur on this account or for any other road restriction, delay, or any other matter which increases the cost of his haulage will be allowed. Such restrictions may be imposed due to dust in dry weather, as well as to road damage due to wet weather.

2.4 Examination of Pipes Prior to Laying

Shortly before laying or fixing any valve, pipe or fitting the Service provider shall in the presence of the Procuring entity carefully examine each valve, pipe and fitting to ascertain damage or defect and quick checking of the Nominal Diameter and Nominal Pressure of the pipes prior to their installation. All damage and all defects revealed by this examination shall be repaired and remedied to the satisfaction of the Procuring entity.

The Service provider shall give the Procuring entity not less than 48 hours' notice of his intention to examine any pipes, etc. and the Service provider shall not proceed to lay such pipes until they have been approved as free from damage and defects by the Procuring entity.

The ends of pipes and fittings shall be examined for circularity. Any distorted ends shall be corrected by an approved method to within the tolerances required by the mechanical couplings or other joints by which the pipes or fittings are to be jointed.

All pipes and fittings which are severely dented or similarly damaged shall be discarded unless in the opinion of the Procuring entity a portion of such pipe or fitting may usefully be salvaged in which case the Service provider may cut off and discard the damaged portion only.

After examination and any necessary repairs and attention, all pipes, fittings, etc. shall be cleaned internally, particular care being taken to ensure that no stones, etc. are bedded in bitumen linings.

2.5 Laying Pipes

Immediately before any pipe is lowered into the trench (not less than 60cm deep), the plug to be provided in accordance with this Clause shall be removed from the end of the last pipe laid and the new pipe shall be carefully lowered into the trench with manpower, a crane or gantry operating within its designed working load or by other approved manner.

Each pipe and fitting shall be laid gently on the bedding so as not to damage the outer surface. Pipes shall be laid true to alignment curve and gradient, in accordance with the Drawings or as directed by the Procuring entity's Representative.

Pipes shall be boned to gradient and sight rails shall be provided for this purpose at intervals not exceeding 50 m and at all changes in grade.

No dips or summits will be permitted other than shown on the Drawings unless otherwise instructed by the Procuring entity's Representative.

Pipes and fittings laid in trench shall have the minimum cover stated on the Drawings or as otherwise directed by the Procuring entity's Representative.

Pipes laid in trenches shall be laid and firmly bedded on an even and uniform bed. Pipes shall not be dragged along the trench bottom. Joint holes shall be excavated below the trench bottom, shall be as small as possible, shall be filled in and compacted after the pipes are laid and before the refilling of the trench is commenced. Survey pegs in the trench bottom shall be removed.

Ovality in pipes shall be removed by internal jacking methods to the approval of the Procuring entity. Pipes with ovality outside the manufacturer's permitted values shall not be used.

Each type of joint shall be made in full compliance with the manufacturer's instructions. Special care shall be taken to ensure the absolute cleanliness of the pipe ends and joint components.

Pipe jointing shall be carried out only by experienced personnel and with close supervision by the Service provider. Further pipe jointing shall not proceed until the previous joint has been inspected by the Procuring entity or his assistant.

The Service provider shall take all steps necessary to ensure that no dirty water or other extraneous matter is allowed to enter the pipes during or after laying. In the event of dirty water or extraneous matter entering the pipes, the Service provider shall immediately carry out the necessary cleaning as may be directed by the Procuring entity. No extra payment will be made or allowed for such work.

As pipe laying proceeds, the Service provider shall prove pipelines are free from obstruction by passing through the pipeline a "badger" which must be kept in the pipes at all times during construction of the pipelines. The "badger" shall be pulled forward and any obstructions or dirt

removed immediately after the laying of each pipe and before the next one is placed in position, so that the barrel of the pipe is left perfectly clean.

The “badger” shall consist of polyurethane foam with dimensions approved by the Procuring entity, with suitable attachments to allow for pulling through the pipes.

Except when necessary for jointing, the end of the last pipe laid shall be plugged to the satisfaction of the Procuring entity and the Service provider shall provide and use a sufficient number of proper plugs for this purpose.

Any damage to the external surface and/or coating or to the internal surface and/or lining of pipes, fittings, etc. or to sleeving sustained during laying shall be repaired and made good to the satisfaction of the Procuring entity who shall be afforded facilities of examining and testing any damaged areas of sheathing, coating, lining and sleeving.

Pipe trenches shall not be backfilled, until permission to do so, has been obtained from the Procuring entity. Subject to such permission being obtained, trenches shall be backfilled without delay to at least the minimum extent required by the specification in readiness for pressure testing. All backfilling shall be without damage to pipes and fittings.

2.6 Pipe Jointing Generally

Pipe jointing surfaces and components shall be kept clean and free from extraneous matter until the joints have been made or assembled. Care shall be taken to ensure that there is no ingress of grout or other extraneous material into the joint annulus after the joint has been made.

Proprietary joints and couplings shall be used only after the Procuring entity’s approval and in accordance with the manufacturer’s instructions. The Service provider shall be responsible for obtaining copies of the manufacturer’s instructions as he requires. The Service provider shall be responsible for obtaining all the special tools, lubricants and appliances necessary for making the joints.

2.7 Welded Joints in Plastic Pipes

Bells of PVC pipes and fittings are equipped in the factory with fixed rubber rings that greatly simplifies installation of the system and makes it possible to achieve more reliable connections. Site welded jointing in PVC pipes are not recommended and will be implemented only if it is approved by the Procuring entity. In case they should be used the joints shall be made in accordance with manufacturer's instructions. When welded pipes are jointed outside the trench, they shall not be lowered into place until the period recommended by the manufacturer for complete setting of the joints has elapsed. A pipe section containing a completed weld shall achieve the same strength characteristics as the parent pipe.

Fusion welded joints in high density polyethylene pipes (HDPE) shall be made only between pipes having the same physical characteristics. All welded joining and especially heat fusion jointing of polyethylene pipes shall only be carried out by operatives who have experience and have undertaken training in accordance with National and/or International requirements.

The ovality of straight polyethylene pipes shall not exceed 2% in diameters up to and including 250 mm, and 3.5% in diameters over 250 mm. The ovality at any section in a coiled pipe after uncoiling shall not exceed 12%. Coiled pipe shall be re-rounded for electrofusion jointing by use of suitable clamps and/or approved inserts.

2.8 Flanged Joints

Flanged joints shall be made with rubber gaskets and galvanized nuts, washers and bolts. Flanges shall be properly aligned before any bolts are tightened. Two washers shall be used per bolt, one under the bolt head and the other under the nut. The tightening of the bolts shall be carried out in the sequence and to the torque recommended by the manufacturer. A torque wrench should always be used and in no case shall excessive tightening be exerted on any nut or bolt.

Jointing compounds shall not be used when making flanged joints, except that, to facilitate the making of vertical joints, gaskets may be secured temporarily to one flange face by a minimum quantity of clear rubber solution. Both threads shall be treated with graphite paste and the nuts tightened evenly in diametrically opposite pairs.

As a general rule, burying of flanged joints shall be avoided. In cases where it is approved by the Procuring entity, the following shall apply:

All buried flange joints shall be protected externally by painting with an approved bitumen paint and then the joint shall be wrapped using “Denso” paste, mastic, tape and outer wrap, or similar approved materials all in accordance with the manufacturer’s instructions.

Flanged adaptors and mechanical couplings, which have a RILSAN nylon coating applied by the manufacturer, require no further external protection. Where the coating of flanged adaptors and couplings applied by the manufacturer has been damaged in transport, handling or laying, such damage shall be made good in accordance with the manufacturer’s instructions before wrapping as above.

The Service provider shall supply all tools and materials necessary for compliance with this clause.

2.9 HOSE STEEL REEL

A hose reel with two wheels will be used to help farmers roll the 70m hose pipe and transport to an another plot or to the warehouse. The reel and all the components shall be made of heavy duty steel coated with epoxy paint and can be supplied by the service provider or can be locally

manufactured, following the instructions of the Procuring entity and the technical specifications. The capacity of the reel should be for 85m D32 hose pipe. The hose reel shall be connected to the plot outlet valve by a short length of hose with a stainless steel or brass quick connection fitting at the valve and a threaded connection to the hose reel hub. The hub allows the hose reel to rotate while water is flowing through the hose.



Brass Male Camlock
Type-F, D32mm



Brass Female Camlock
Type-C, D32mm

The main components of the reel are:

- Steel frame
- 2" wheels and the axle
- The handle
- The base where the reel will be based and joined
- Basket flange, basket hub and the crank handle
- Water system which will be joined on the ball valve at the plot outlet.



Chapter 3: Micro Drip and sprinkler Connectors

All connectors for drips will possess the following technical specifications:

| Product Range | Fast Ring Connectors | Drip Tape Connectors | ProGrip Connectors | Heavy Wall Connectors | Layflat Connectors |
|---------------|---|---|---|---|---|
| Use with | Thin wall drip line (without seam). Up to 25 mil wall thickness | Thin wall drip tape (with seam). Up to 15 mil wall thickness | Thin wall drip line & drip tape. Up to 25 mil wall thickness | 8, 12, 16, 17 & 20 mm heavy wall drip line & LDPE | 2", 3", 4" & 6" layflat |
| |  |  |  |  |  |

Fig :1 : Micro drippers connectors

| S/N ^o | Product Description | Photo |
|------------------|--|---|
| 1 | Start Connector with Gasket, from PVC or PE pipe x Fast Ring 16 mm |  |
| 2 | Gasket for Start Connector from PVC or PE Pipe |  |
| 3 | Start Connector from LDPE pipe x Fast Ring 16 mm |  |
| 4 | Start Connector with Gasket, from PVC or PE pipe x Fast Ring 22 mm |  |
| 5 | Gasket for Start Connector from PVC or PE pipe |  |
| 6 | Start Connector from LDPE pipe x Fast Ring 22 mm |  |
| 7 | Start Connector XL x Fast Ring 22 mm |  |
| 8 | Start Connector for Layflat x Fast Ring 22 mm |  |

Table 1: Micro drippers

Sprayer kits and Rain pipe

SPRAY KIT 500m² (40mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 350/40mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (40mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 400/40mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (40mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 450/40mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 350/50mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 400/50mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Rain hose 450/50mm | 100 meters |
| 2 | Tee 4 way coupler 63mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

SPRAY KIT 500m2 (40mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 350/40mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (40mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 400/40mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (40mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 450/40mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 40mm lock | 4 pieces |
| 4 | Straight connector 40mm lock | 4 pieces |
| 5 | End cap 40mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 350/50mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 400/50mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

SPRAY KIT 500m2 (50mm)

| No | PRODUCT | QUANTITY |
|----|-------------------------------|------------|
| 1 | Rain hose 450/50mm | 100 meters |
| 2 | Tee 4 way coupler 75mm | 4 pieces |
| 3 | Ball valve 50mm lock | 4 pieces |
| 4 | Straight connector 50mm lock | 4 pieces |
| 5 | End cap 50mm lock | 4 pieces |

MINI SPRAYER KITS**MINI SPRAY KIT 1000m2 (32mm)**

| No | PRODUCT | QUANTITY |
|----|------------------------------|------------|
| 1 | Mini Rain hose 350/32mm | 200 meters |
| 2 | Tee 4 way coupler 63mm | 8 pieces |
| 3 | Ball valve 32mm lock | 8 pieces |
| 4 | Straight connector 40mm lock | 8 pieces |
| 5 | End cap 40mm lock | 8 pieces |

MINI SPRAY KIT 1000m2 (20mm)

| No | PRODUCT | QUANTITY |
|----|----------------------------------|------------|
| 1 | Mini Rain hose 250/20mm | 400 meters |
| 2 | Take off connector 20mm lock | 30 pieces |
| 3 | Straight connector 20mm lock | 10 pieces |
| 4 | End cap 20mm lock | 30 pieces |
| 5 | Drill bit (stainless steel 20mm) | 1 piece |
| 6 | Grommet 20mm | 30 pieces |

| | |
|------------------------|----------------------------------|
| Wall Thickness (Range) | From 380 Micron to 900micron |
| Diameter (Range) | From 20mm to 50 mm |
| Width of Spray | 6 Meter (3 Meter on either side) |
| Operating Pressure | 1 bar |
| Area of Coverage | Ranging from 500m2 to 4000m2 |
| Expected Life | 5Years to 10Years |

| | |
|---------------|---|
| Suitable Crop | Onion, Groundnut, Vegetables, Greens and Other Closely Spaced Crops |
|---------------|---|

| Soil Type | Soil Characteristics | Flow Rate Range |
|-----------|----------------------|--|
| Clay | Does not drain well | Low Flow: .11-.16 Gallons Per Hour (GPH) |
| Loam | Drains well | Medium or High Flow: .18 -.46 GPH |
| Sand | Drains the fastest | High Flow: .33-.46 GPH |

Drip tape

| Specification | | |
|------------------------|---------------------------------------|--|
| Wall Thickness (Range) | From 350 Micron to 900micron | |
| Diameter (Range) | From 20mm to 40 mm | |
| Drip Hole Spacing | 45 cm | |
| Dripper | No Dripper. Only Simple Holes. | |
| Area coverage | Ranging from 500m2 to 4000m2 | |
| Water Discharge | 9 LPH | |
| Operating Pressure | 1 bar | |
| Expected Life | 5Years to 10Years | |
| Suitable Crop | Closely Spaced Crops, Vegetables etc. | |
| Soil Type | Soil Characteristics | Flow Rate Range |
| Clay | Does not drain well | Low Flow: .11-.16 Gallons Per Hour (GPH) |
| Loam | Drains well | Medium or High Flow: .18 -.46 GPH |
| Sand | Drains the fastest | High Flow: .33-.46 GPH |

3.1 RAIN GUN SPRINKLER

Chapter 1: 1-1/4" Impact Rain Gun Sprinkler FNPT w/Nozzle Set - (10, 12, 14 mm) x 4 mm should have the following features and material:

Features:

- Aluminum pressure die casted body & arm
- Heavy-duty brass nut, tube & diffuser screw
- Stainless steel pivot pin, springs, nut & bolt

- Parts made of high quality plastic for durability
- Operates in both full circle and part circle mode
- Jet breaker screw to change the water jet from heavy droplets to fine spray
- Recommended spacing up to 100 ft. (30m) for higher distribution uniformity

Material:

- Body: Aluminum
- Arm: Aluminum
- Spring: Stainless Steel
- Pin: Stainless Steel
- Diffuser Screw: Brass



Fig2: Sprinkler head

3.2 Tripod

63" Tripod Stand for 1-1/4" Rain Guns

| | |
|---------------------|------------------|
| Inlet/Outlet | 1-1/4" MNPT |
| Height | 63" or 1.6m |
| Material | Galvanized Steel |
| Weight | 29 lbs. or 13Kg |



Fig 3: Tripod

3.3 Mini –Sprinklers

Plastic Butterfly Mini-Sprinkler - 5/32" Nozzle



Fig 4: Mini sprinkler head

3.4 1.2M Metal Stake, Hose with 13mm barbed quick connect, Plastic Base for 1/2" Plastic Sprinkle



Fig 5: Metal stake

3.5 : 1/2" Plastic Impact Sprinkler 24° - 2.5 x 1.8 mm, Base, Hose, 1.2m Metal Stake Riser

For commercial agriculture. Flow: 2.6-7.3 GPM, Radius: 32.8-39.4 feet, Pressure: 30-55 PSI. Includes soft PVC tubing with connections, sprinkler head base adapter and 48" metal stake.

| | |
|---------------------------|---------------------------------|
| Base | 1/2" MNPT |
| Flow | 2.6-7.3 GPM or 0.16l/s -0.45l/s |
| Throw Radius | 32.8-39.4 ft.or 9.8m to 11.8m |
| Operating Pressure | 30-55 PSI or 2bar to 3.7bar |
| Trajectory Angle | 24° |
| Operation | Full Circle |
| Drive Mechanism | Spring Arm Impact |

Material:

- **Body:** Plastic
- **Spring:** Stainless
- **Pin:** Stainless Steel



Fig6: Sprinkler head

Chapter 4: VALVES

4.1 Gate Valves

Gate valves will be installed to control the flow at selected points of the irrigation system and facilitate its operation and maintenance. The locations of the valves will be presented on design proposed by farmer

All valve bodies shall be manufactured from close grained cast iron and shall be hydraulically tested closed ended to 1.5 times the maximum working pressure and the valve seats to the maximum working pressure at which pressure they shall be drop tight. These tests shall be carried out at the manufacturer's plants before delivery. Packed glands shall be arranged for easy replacement of the packing, which shall be accessible without removal of the valve from the pipe in which it is fitted. Precautions shall be taken to prevent corrosion of the valve spindles in contact with the gland packing.

All valves shall have flanges to EN 1092-2:1997 “Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges”. Flange-less valves will not be accepted.

The Supplier shall provide factory test and inspection certificates with respect to all valves and fittings.

Gate valves shall conform generally to BS 5163:2004 “Valves for water purposes. Predominantly key-operated cast iron gate valves. Code of practice”. All gate valves shall be of the inside screw non-rising stem wedge-gate type suitable for waterworks purposes.

The valve gates shall be double faced cast iron made in one piece. The wedge seats (ring faces) and corresponding body seats shall be gunmetal, machined and having broad bearing surfaces securely fixed to machined recesses. The recesses for the spindle nuts shall be smooth and even,

so that on opening or closing the valve stresses are evenly distributed over the bearing areas. The gate guides shall be cast integrally with the valve bodies.

The spindles shall be solid forged bronze or stainless steel and shall have machined square threads. The spindles shall be truly circular throughout their lengths and shall be of such lengths that when the valves are closed the bottom ends of the spindles engage fully in the spindle nuts. The spindle collars or thrust plates shall be concentric and machined, suitable for the specified working pressures.

The spindle nuts shall be gunmetal or stainless steel, square threaded to suit the spindles. The thicknesses and bearing areas of the shoulders of the nuts shall be adequate to resist operating thrusts.

All gate valves shall close in the clockwise direction and shall be supplied with gearing and detachable handwheels for operation by one man under an unbalanced pressure of 7 kg/sq.cm. Arrows shall be cast on each handwheel to indicate the direction of opening and closing. Visual indicators showing valve opening positions as well as locking devices for preventing unauthorised operation shall also be provided.

The type of Series 405-NRS-RW Non-Rising Stem, Resilient Wedge, Flanged Gate Valves–Epoxy Coated (http://www.watts.com/pages/_products_details.asp?pid=633) manufactured by WATTS can cover the above specifications and the Supplier should supply a similar or better valve as this type.



4.2 Butterfly Valves

Butterfly valves will be installed to control the flow at selected points of the irrigation system and facilitate its operation and maintenance. the locations of the valves will be presented on design proposed by farmer

Valves shall be of the tight shut-off, resilient seat type, generally in accordance with EN 593:2009 & A1:2011 “Industrial valves. Metallic butterfly valves”. The valve at the head of the secondary

pipes should be lockable. For valves in pipes with diameter greater than D350 an operating wheel shall be provided.

Valves shall provide tight shut-off at rated pressures with flow in either direction and shall be satisfactory for frequent operation, and for applications involving valve operation after long periods of inactivity.

The valve body shall be from ductile iron and capable of withstanding a test pressure 1.5 times normal working pressure and the seats normal working pressure without leakage.

The valve should be supplied for operation by lever. They shall be self-locking and designed to hold the valve in any intermediate position between fully open and fully closed without creep. The operator shall be fitted with an indicator to show valve “open” and “closed”. The Supplier shall ensure that there is sufficient clearance between the disc and the adjoining pipework to ensure that all butterfly valves operate freely, from fully open to fully closed and vice versa, under all conditions.

The type of Series BF-03 Resilient Seated Butterfly Valves manufactured by WATTS (http://www.watts.com/pages/_products_details.asp?pid=567) can cover the above specifications and the Supplier should supply a similar or better valve as this type.

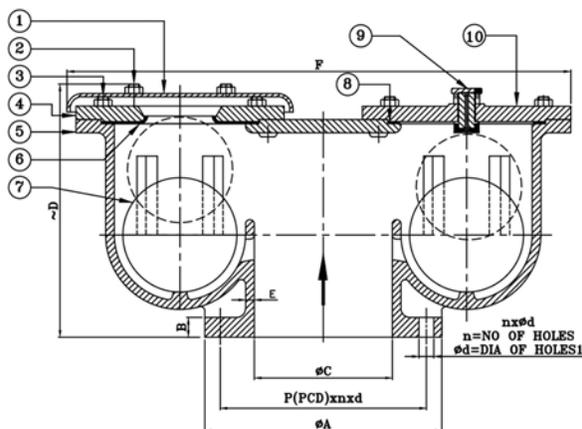


4.3 Air Valves

4.3.1 General

Air valves shall be flanged mounted and of the double ball pattern. Double ball air valves shall incorporate one small and one large orifice in a single unit.

Large orifice air valves shall automatically release or admit bulk volumes of air during either filling or emptying of the pipeline.



MATERIAL SPECIFICATION

| P.No. | NAME OF PART | MATERIAL |
|-------|------------------------|--|
| 1 | COVER PLATE | STEEL |
| 2 | BOLTS AND NUTS | CARBON STEEL (BS 916) |
| 3 | STUDS AND NUTS | CARBON STEEL (BS 916) |
| 4 | COVER | CAST IRON (BSEN 1561 Gr.200) |
| 5 | BODY | CAST IRON (BSEN 1561 Gr.200) |
| 6 | SEAT RING | SYNTHETIC RUBBER (IS 638 TYPE B) |
| 7 | BALL | EPDM COATED WOODEN BALL |
| 8 | PACKING RING | SYNTHETIC RUBBER (IS 638 TYPE B) |
| 9 | NIPPLE (RUBBER COATED) | GUN METAL (BSEN 1982 CC491K) / STAINLESS STEEL (ASTM A182 Gr. F6a) |
| 10 | COVER | CAST IRON (BSEN 1561 Gr.200) |

4.3.2 Specific requirements

Air valve bodies and covers shall be of cast iron to BS EN 1561:2011 “Founding. Grey cast irons” or spheroidal graphite cast iron to BS EN 1563:2011 “Founding. Spheroidal graphite cast irons”.

Floats, guides and levers shall be formed by injection moulding of acrylonitrile butadiene styrene or similar approved material.

All flanged connections shall be faced and drilled in accordance with the specified pressure rating to EN 1092-2:1997 “Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges”.

Air valves shall be flanged and supplied with built-in or with double flange isolating valve or cock, which will enable overhauling or dismantling of air valves without disrupting water flow in the pipeline.

Coating shall be of high standard epoxy coating system, details of which must be submitted for evaluation and approval.

4.4 Non-Return Valves

4.4.1 General

Non-return valves shall be flanged mounted and designed to permit flow in one direction only, automatically preventing reverse flow through the pipeline. The valve shall operate without external actuation, relying solely on internal pressure differential to open or close.

4.4.2 Design Features

The valve shall be of the swing type or spring-loaded type, depending on the application and pressure class. The internal disc or flap shall close promptly upon flow reversal to prevent backflow. The valve body shall be constructed to accommodate full bore flow with minimal pressure loss. The sealing surfaces shall be corrosion-resistant and designed for tight shut-off under all operating conditions. The valve shall be suitable for horizontal or vertical installation, as specified in the drawings.

4.4.3 Materials

- **Body and Bonnet:** Ductile iron or stainless steel, conforming to ASTM A536 or A351 standards.
- **Disc/Flap:** Stainless steel or rubber-coated metal, suitable for potable water or wastewater applications.
- **Seat:** EPDM or NBR elastomer, resistant to wear and chemical degradation.
- **Fasteners:** Stainless steel, corrosion-resistant.

4.4.4 Performance Requirements

- Rated for a minimum working pressure of 10 bar.
- Leakage rate shall comply with ISO 5208 Rate A (zero visible leakage).
- Valve shall be tested hydrostatically at 1.5 times the rated pressure.
- All valves shall be factory tested and certified prior to delivery.

4.5 Ball valves

Brass ball valves will be used in the case of the plot outlet with a steel hand lever. The specifications of the ball valves should follow the specs of model FBV-3C Brass Ball Valve manufactured by WATTS (http://www.watts.com/pages/_products_details.asp?pid=3391) and the supplier should supply a similar or better valve as this type.



4.5.1 Double Union PVC Ball Valve Slip/Weld with Orange Handle

Features:

- Quarter-turn handle operated ball valve
- TPE seals with O-ring gives cushioning effect that ensures leakage free and low fixed torque
- Union nut load does not transfer onto ball
- Chemical and corrosion resistant, color UV stabilized

Material:

- **Body:** PVC



Chapter 5: SOLAR, DIESEL OR PETROL AND HAND PUMPS

The Pumps should range of self-priming engines pumps are of fully portable design suitable for irrigation, dewatering and general pumping duties. All models feature open impellers suitable for pumping lightly silted water and a sturdy carrying and protection frame. Also included are quick couple hose connectors and suction strainers. Maximum suction is 8m at sea level, though this will be reduced at altitudes.

For all pumps, the pump body and impellers are manufactured from high grade cast aluminium.

ECONO models use different specification components and are recommended for light duties and shorter operating periods.

1.1 ENGINE

Two engine options will be available as follows:

Petrol

Proprietary air-cooled, 4-stroke OHV single cylinder with transistorized ignition and oil alert.

Diesel

A high efficiency direct injection air-cooled diesel engine.

Note that performance curves for all engines relate to the engine governor set at maximum speed of 3600rpm to achieve maximum rated power output. To prolong engine life pumps should only be run under maximum power conditions for short periods and for extended duty the throttle setting should be reduced to approximately three-quarters power. Pump performance will then be reduced accordingly

5.2 Pedal pump

Particular features are:

1. Up to 4,000 litres per hour output
2. Suction lifts up to 6m, delivery pressure up to 13m
3. Suitable for up to 5 sprinklers, hose or furrow irrigation
4. Irrigates up to 1 hectare
5. Easily portable and no installation required

5.3 Hand Pump

SPECIFICATIONS

Pump Head

Fabricated throughout from hot dipped galvanized mild steel components for corrosion protection with tri-leg pedestal design. Pre-greased ball bearings are provided at the handle for long life and ease of operation. Pump stroke is 125mm.

Cylinders

1 21/2" (65mm) diameter Standard cylinder with brass liner, cast iron closed end caps and double nitrile rubber plunger seals.

Capacity per stroke is 400cc.

1 21/2" (65mm) diameter Extra Deepwell cylinder as above with triple nitrile rubber plunger rod seals. Capacity per stroke is 400cc.

1 2" (50mm) diameter VLOM cylinder with brass liner, cast iron open top end caps and double nitrile rubber plunger rod seals.

Capacity is 250cc per stroke.

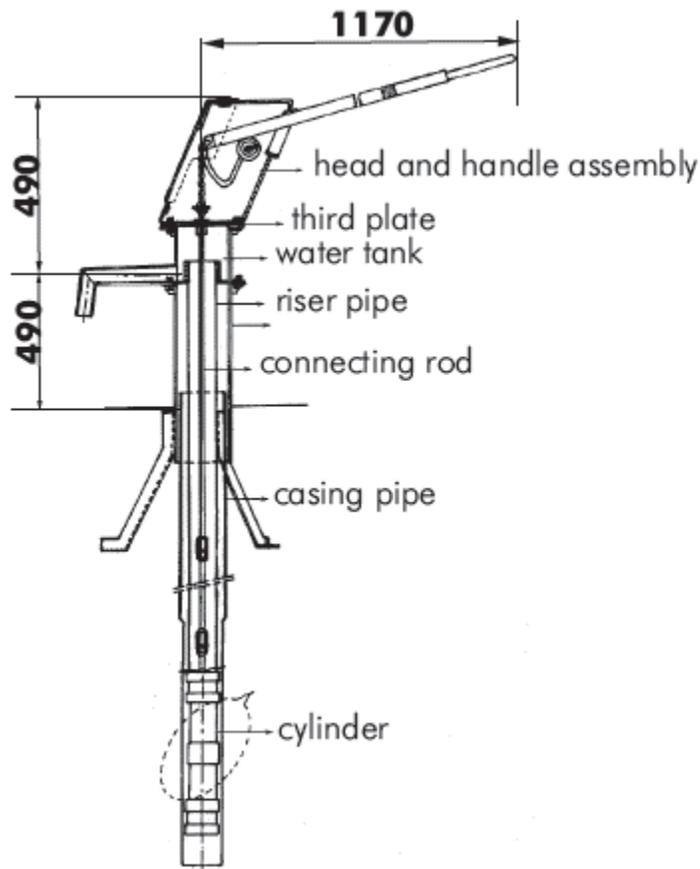
1 2" (50mm) diameter VLOM UPVC 'Afridev' cylinder with brass liner, plastic plunger and foot valve. Capacity is 250cc per stroke.

Rising Main

Option of 1 1/2" gi for closed cap cylinders and 2" gi or PVC for VLOM 2" open top cap cylinders supplied in 3m lengths. PVC drop 4 pipes require rod and pipe centralisers to prevent wear damage. Note that rising mains need removal for servicing of closed cap cylinders, though remain in place in VLOM installations.

Pump Rods

Option of 10mm electro galvanized mild steel or stainless steel rods in standard 3m lengths with screwed couplings



5.4 Solar Pumps

SOLAR pumps are specifically designed for PV solar powered water supply from wells and boreholes. They are of centrifugal and rotary screw design and material of construction for rotary screw design are principally stainless steel with a rubber stator while centrifugal design features noryl impellers and stainless steel chambers. Pumps are supplied complete with a controller, cable connectors, water level sensor, solar PV connecting cables and spare rotor or impellers depending on type.

Motor

Permanent magnet, oil filled, brushless, direct current, non-sensor DC motor specifically designed for maximum efficiency from solar module power sources. It should be powered by solar array configured to provide the input voltage required and sized at approximately 130% of the rated motor power

Controller

The pump is supplied with a self-contained multifunction MPPT (Maximum Power Point Tracking) controller that tracks the solar module's maximum power output voltage which varies with module temperature and irradiation levels. This ensures maximum current output, typically +25% higher than conventional module controllers and a similar increase in daily water output. The controller also protects from over and under voltage, over current and low water level (if electrodes are fitted) and features various indicator lights that give the pump's operating status. The system can be installed either with or without batteries. If batteries are included, the pump will operate when there is insufficient solar irradiation for direct power

Power Outputs

Pump output curves are given at standard test conditions of 1000W/m solar irradiance and 25 C. Output will vary throughout the year depending upon prevailing irradiation levels. For estimated daily outputs at continuous pumping, multiply the indicated output at the duty point by the daily irradiation given in Graph

| Operating Conditions | |
|-----------------------------|--|
| Pumped Liquid | Thin, clean, chemically non-aggressive liquids with a sand content of less than 0.1% |
| Liquid Temperature | +40C |
| Minimum immersion depth | 0.5m |
| Maximum immersion depth | 20m |
| Ambient Temperature | -20C - +50C |
| Minimum borehole diameter | 125mm |
| Pump Information | |
| Model | D3SOLAR120H |
| Type | Helical Rotor |
| Dimension(mm) DN | 3/4" |
| Motor Rating (W) | 120 |

| Operating Conditions | |
|-----------------------------|-----|
| Dimension(mm) D | 820 |
| Input Power Required (W) | 160 |
| Input Voltage (V) | 24 |
| Dimension(mm) C | 76 |
| Weight (kg) | 12 |



HDPE Membrane Properties (Dam sheet)

HDPE waterproofing membranes (high density polyethylene) complies with the following specifications:

| | |
|--|---------------------------|
| Tensile strength at break EN 12311-1:1999 | >26 (N/mm ²) |
| Tensile yield strength EN 12311-1:1999 | >15 (N/mm ²) |
| Break elongation EN 12311-1:1999 | >700 % |
| Yield elongation EN 12311-1:1999 | >9 % |
| Tear resistance EN 12310-1:1999 | >130 (N/mm ²) |
| Puncture resistance EN ISO 12236:2006 | >300 (N/mm ²) |
| Tearing limit EN ISO 12236:2006 | >5000 (N) |
| Multiaxial elongation at break EN 12311-1:1999 | >15 % |

The membrane specification sheet should include behavior at exposure to UV radiation and should certify the membrane suitability for installation without coating. The membrane should be resistant to extreme temperatures, to UV radiation and to microorganisms. The mixture for preparing the membrane should contain an appropriate antioxidant material and suitable stabilizer against high temperatures. Plasticizers or other additives should not be contained into the mixture as they are eliminated over time and contribute to the aging of the material.

In any case the supplier will accept the use of the proposed material, following the submission of the specification sheets and the written consent of the Procuring entity. As a minimum the supplier must provide the following:

- Certificates proving the Supplier's experience in the use of the membrane in other and similar size projects.
- Product specifications from the Supplier's factory certifying the product composition, the mechanical properties of it and the aging resistance.
- Supplier's written consent, regarding the life warranty of the material at the project environment and materials conditions

FILTERS

Manual Disc Filter

This provides greater holding capacity as filtration is performed through the entire ring depth and not just the surface. During filtration, the rings are compressed together effectively filtering the water and protecting the system from clogging.

Manual Disc Filters are Procuring entitled for efficient operation year after year with practically no maintenance. Plastic rings stack together creating a cylindrical filter element. During filtration, the rings are compressed together effectively filtering the water and protecting the system from clogging. Works well as a stand-alone unit or combined to form modular filter batteries. Available sizes 3/4" to 6" with mesh (micron) ranges from 40 to 200

With following features:

- ❖ Extra-large filtration capacity
- ❖ Less cleaning
- ❖ Corrosion resistant - 100% thermoplastic discs
- ❖ Available sizes: 3/4" to 3"
- ❖ Flow ranges: 1 - 175 GPM
- ❖ Mesh options: 120 or 140



FERTIGATION SYSTEM

Mild steel construction. Separate valves are provided on the inlet & outlet to control the injection rate. High pressure hose assembly inlet / outlet connection. Wide 8” opening for easy pouring of stock solution. Maximum working pressure 10 kg/cm² (142 psi). Available in 30, 60, 90, 120 & 160 liter (8, 16, 24, 32 & 42 US gallon) capacity. Can also be supplied in stainless steel material

Applications Fertilizer and chemical injection through drip and sprinkler irrigation systems.

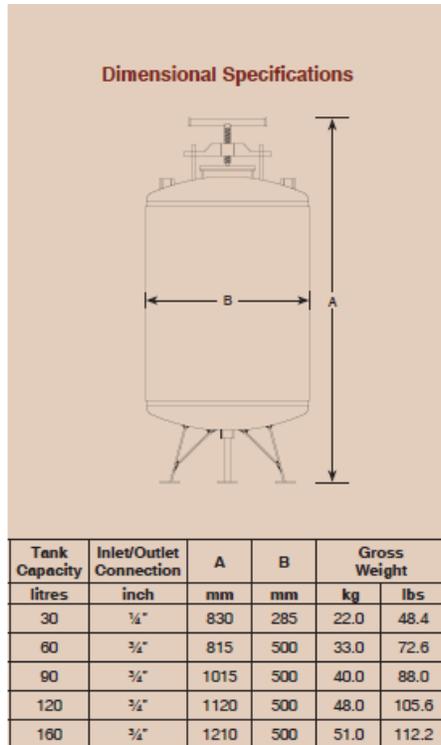


Fig :7 Fertigation Unit stem

Flange Adaptors

Flange adaptors shall be made of ductile iron or steel and sized in accordance with the diameter of the pipes or fittings and rated as per the maximum service pressure of the system.

Flange adaptors shall consist of two sleeves sliding into one another and fitted with an assembly flange at each end drilled to BS EN 14525:2004: "Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, grey iron, steel, PVC-U, PE, fibre-cement". Water tightness at the point of sliding shall be ensured by a rubber seal compressed by an intermediate companion flange.

SPECIAL HDPE 100 AND DRIP FITTINGS

| Photo/Schetch | Item |
|---|----------------------------|
|  | MALE ADAPTOR |
|  | MALE TEE |
|  | INTERMEDIATE UNION |
|  | EQUAL TEE |
|  | REDUCED UNION |
|  | REDUCED ELBOW |
|  | MALE ELBOW |
|  | PP COMPRESSION EQUAL VALVE |
|  | FEMALE ADAPTOR |
|  | FEMALE TEE |

| | |
|---|--|
|  | <p>REDUCED TEE</p> |
|  | <p>END CAP</p> |
|  | <p>EQUAL ELBOW</p> |
|  | <p>FEMALE ELBOW</p> |
|  | <p>PP COMPRESSION CONNECTING VALVE WITH METAL BALL</p> |
|  | <p>PP COMPRESSION FEMALE VALVE</p> |
|  | <p>HOSE ADDITION</p> |
|  | <p>Mini Ball Valve</p> |
|  | <p>ADJUSTABLE DRIPPER</p> |
|  | <p>ROTATING SPRAYER</p> |
|  | <p>MINI SPRINK FOR GREEN HOUSE</p> |
|  | <p>PUNCH DRILLING APPARATUS</p> |

Irrigation travelling machines and Water Pumps

| | |
|---|--|
| <p>Traveller irrigation machine, Effective irrigation Length: 400 Meter Hose Length and Inside Diameter: 200meter - 65mm Effective Spray Width: 40 Meter - 60 Meter Cable Length, diameter: 400 Meter - 6 mm Rain gun Type: JET55 Flow Rate: 18m³/h - 45 m³/h Recommended Working pressure: 4 bar-8 bar Travel Speed: 10meter/hour - 70meter/hour PTO Air Compressor Standard for Hose Clean 20' Container Loading Capacity: 4 Weight (kg): 790 kg Box Dimension: 265 cm X 115 cm X 185 cm</p> |  |
| <p>Traveller irrigation Effective irrigation Length: 300 Meter Hose Length and Inside Diameter: 150meter - 76mm Effective Spray Width: 60 Meter - 90 Meter Cable Length, diameter: 300 Meter - 6 mm Rain gun Type: JET55 Flow Rate: 28m³/h - 66 m³/h Recommended Working pressure: 4 bar-8 bar Travel Speed: 12meter/hour - 70meter/hour PTO Air Compressor Standard for Hose Clean 20' Container Loading Capacity: 4 Weight (kg): 800 kg Box Dimension: 265 cm X 115 cm X 185 cm</p> |  |
| <p>Traveller irrigation, Effective irrigation Length: 400 Meter Hose Length and Inside Diameter: 200meter 90mm Nitril Effective Spray Width: 60 Meter - 100 Meter Cable Length, diameter: 400 Meter - 8 mm Rain gun Type: JET65 Flow Rate: 28m³/h - 100 m³/h Recommended Working pressure: 4 bar-8 bar Travel Speed: 15meter/hour - 90meter/hour 3 Speed Gearbox + Air compressor</p> |  |

| | |
|---|--|
| <p>20' Container Loading Capacity: 1 - 40' Container Loading Capacity: 3 Weight (kg): 1300 kg - Box Dimension: 310 cm X 140 cm X 185 cm</p> | |
| <p>Traveller kits: irrigation Length: 500 Meter Hose Length and Inside Diameter: 250meter - 90mm TPU Effective Spray Width: 60 Meter - 100 Meter Cable Length, diameter: 500 Meter - 8 mm Rain gun Type: JET65 Flow Rate: 28m³/h - 100 m³/h Recommended Working pressure: 4 bar-8 bar Travel Speed: 15meter/hour - 90meter/hour 3 Speed Gearbox + Air Compressor 20' Container Loading Capacity: 1 - 40' Container Loading Capacity: 3 Weight (kg): 1450 kg - Box Dimension: 310 cm X 140 cm X 185 cm</p> |  |
| <p>19 HP Diesel - 2 Cylinders Moto pump 2 Stage - Electric Start - 3000 RPM China Made Engine - Turkish Made Water pump</p> |  |
| <p>Mini irrigation kits 7,5 HP Moto pump (380V - 50HZ, 6 bar 17m³/hour) 75mm 5 Mt Length HDPE Pipe - PN5 1 Set include 70 pcs Pipe, Total 350- meter Pipeline Suction Pipe 3" PVC - 76mm 6mt Roll Suction Valve - 3"-76mm with 4 pcs Clamp Suction Quick Coupling Set 3" - Pump side 90mm Male 2,5" - 75mm Plastic Line Valve -PN5 (For Hydrants) Gasket 75mm 75 X 75 TE (For Hydrant)</p> |  |

| | |
|---|--|
| <p>75x51 Reduction for Hydrant Connection Pump Outlet (2,5") For Moto pump 75mm Aluminum Elbow 75mm - 2,5" End Plug 75mm - 2,5" 2,5" - 75mm Abot + 1" Air Release Valve 20 DC Container Capacity</p> | |
| <p>KOSHIN 2-inch Water Pump</p> <p>Pump connection 2" (50 mm) Maximum flow ~600–640 L/min Maximum head ~27–30 m Maximum suction lift 8m Engine type 4-stroke gasoline Engine displacement ~122–163 cc Rated power ~2.9–3.9 PS Fuel Unleaded petrol Fuel tank ~2.0–3.1 L Included accessories Strainer, hose couplings, clamps</p> |  <p>A black and silver KOSHIN 2-inch water pump. It features a black metal frame, a silver pump head on the left, and a black engine housing on the right with 'KOSHIN' and 'DIESEL' branding. The pump is mounted on four small black feet.</p> |
| <p>KOSHIN 3-inch Water Pump</p> <p>Pump connection 3" (80 mm) Maximum flow ~1100 L/min Maximum head ~27 m Maximum suction lift 8m Engine type n 4-stroke gasoline Engine displacement ~163 cc Rated power ~4.2 PS Fuel Unleaded petrol Fuel tank ~3.1 L Included accessories Strainer, hose couplings, clamps</p> |  <p>A black and silver KOSHIN 3-inch water pump. It features a black metal frame, a silver pump head on the right, and a black engine housing on the left with 'KOSHIN' branding. The pump is mounted on four small black feet.</p> |

Irrigation kits:

11 HP Gasoline Moto pump - (6 bar - 24m³/hour)

2" PVC Lay flat High Pressure Suitable for 8 Bar 50 Meter

2" Heavy Duty Clamp for Coupling

2" Female Coupling for Lay flat Hose

2" male Coupling for Lay flat Hose

Suction Pipe 3" PVC - 76mm 6mt Roll

Suction Valve - 3"-76mm with 4 pcs Clamp

Suction Quick Coupling Set 3"- Pump side 90mm Male

2" - 63mm Plastic Line Valve -PN5 (For Hydrants)

Gasket 63mm

63 X 63 TE (For Hydrant)

Pump Outlet (2") For Moto pump

63mm Aluminum

Elbow 63mm - 2"

End Plug 63mm - 2"

2" - 63mm Abot + 1" Air Release Valve

20 DC Container Capacity



Mini irrigation kits.

11 HP Gasoline Motor pump - (6 bar - 24m³/hour)

75mm 5 Mt Length HDPE Pipe - PN5

1 Set include 70 pcs Pipe, Total 350-meter Pipeline

Suction Pipe 3" PVC - 76mm 6mt Roll

Suction Valve - 3"-76mm with 4 pcs Clamp

Suction Quick Coupling Set 3"- Pump side 90mm Male

2,5" - 75mm Plastic Line Valve -PN5 (For Hydrants)

Gasket 75mm

75 X 75 TE (For Hydrant)

75x51 Reduction for Hydrant Connection

Pump Outlet (2,5") For Moto pump

75mm Aluminium

Elbow 75mm - 2,5"

End Plug 75mm - 2,5"



| | |
|---|--|
| <p>2,5" - 75mm About + 1" Air Release Valve 20 DC Container Capacity</p> | |
| <p>Midi TD2200 - 200 12 HP Diesel Motopump - (6 bar - 25m³/hour) 75mm-(2,5") 5 Mt Length HDPE Pipe - PN5 (1 Set include 70 pcs Pipe, Total 350-meter Pipeline) Suction Pipe 3" PVC - 76mm 6mt Roll Suction Valve - 3"- 76mm with 4 pcs Clamp Suction Quick Coupling Set 3" Pump Side 90mm Male BSP 2,5" - 75 mm Plastic Line Valve - PN5 (for Hydrants) Q75mm Gasket 75mm / 75mm TE (For Hydrant) 75X63 Aluminium Reduction for Hydrant 75mm Female Pump Outlet for Motor pump 2,5" - 75mm Elbow 2,5" - 75mm Male End CAP 2,5" - 75mm Abot + 1" Air Release Valve 20 DC Container Capacity</p> |  |
| <p>Irrigation kits 17 HP Diesel Motor pump - (6 Bar - 30m³/hour) 3" - Q90mm - QC Pipe System 5.8 Mt HDPE Pipe - PN5 (1 set Include 80pcs Pipe, Total 464-meter Pipeline) Suction Pipe 4" PVC - 101mm 8mt Roll Suction Valve - 4" - 101mm with 4 pcs Clamp 2,5" - 75 mm Plastic Line Valve - PN5 (for Hydrants) Q90mm Gasket Q75mm Gasket 90mm / 75mm TE (For Hydrant) 90mm / 90mm TE</p> |  |

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| <p>75X63 Aluminium Reduction for Hydrant 90mm Female Pump Outlet for Motor pump 3" - Q90 mm ES Part for Pump Outlet 3" - 90mm Elbow 3" - 90mm Male End Cap 2,5" - 75mm Male End CAP 3" - 90mm Abot 1" Outlet + 1" Air Release Valve 20 DC Container Capacity</p> | |
| <p>irrigation kits: 19 HP Diesel Motor pump (3000 rpm, 6 bar 40m3/hour) 3" - 90mm 5 Mt Length HDPE Pipe PN5 (1 Set include 210 pcs Pipe, Total 1050-meter Pipeline) Suction Pipe 4" PVC - 101mm 8mt Roll Suction Valve - 4" - 101mm with 4 pcs Clamp 2,5" - 75mm Plastic Line Valve - PN5 (For Hydrants) Q90mm Gasket Q75mm Gasket 90mm / 75mm TE (For Hydrant) 75X63 Aluminium Reduction for Hydrant 110mm Female Pump Outlet QC - 4" Male Screw BSP 4" - Q110mm ES Part for Pump Outlet 110mm / 90mm Cross TE 3" - 90mm Elbow 3" - 90mm Male End Cap 2,5" - 75mm Male End Cap 3" - 90mm Abot 1" Outlet + 1" Air Release Valve 20 DC Container Capacity</p> |  |
| <p>irrigation kits. DCR80 Tractor Operated pump - (7 bar - 55m3/hour) 3" - 90mm 5Mt Length HDPE Pipe PN5 (1 Set include 260 pcs Pipe, Total 1300-meter Pipeline)</p> | |

Suction Pipe 4" PVC - 101mm 8mt Roll
 Suction Valve & Coupling - 4" - 101mm with 4 pcs Clamp
 2,5" - 75mm Plastic Line Valve - PN5 (For Hydrants)
 Q90mm Gasket
 Q75mm Gasket
 90mm / 75mm TE (For Hydrant)
 75X63 Aluminium Reduction for Hydrant
 (Q75mm Motor pump and Q63 Female Pump Outlet)
 110mm Female Pump Outlet QC - 4" Male Screw BSP
 4" - Q110mm ES Part for Pump Outlet
 110mm / 90mm Cross TE
 3" - 90mm Elbow
 4" - 110mm Male End Cap
 3" - 90mm Male End Cap
 2,5" - 75mm Male End Cap
 3" - 90mm Abot 1" Outlet + 1" Air Release Valve
 JET50 Rain gun Set With 4 Pod Connection Stant
 (if Customer want operate Just Rain guns for Small Fields)
 20 DC Container Capacity



Eco irrigation kits:

60 HP Diesel Motor pump - (Maximum 7,5 Bar - 115m³/hour)
 4" - Q110mm - QC Pipe System 5.8 Mt HDPE Pipe - PN6 (1 set Line need 450pcs Pipe, Totally 2610-meter Pipeline)
 6" - Q160mm - QC Pipe System 5.8 Mt HDPE Pipe - PN8 (1 set Line need 70pcs Pipe, totally 406-meter Pipeline)
 Suction Pipe 5" PVC - 125mm 8mt Roll
 Suction Valve - 5" - 125mm with 4 pcs Clamp
 For 110mm QC pipe x 90mm - 3" male Outlet (Hydrant TE - Metal)



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| <p>3" - Female Metal Hydrant for Connection Q160mm Gasket Q110mm Gasket Q90mm Gasket Q75mm Gasket 110mm Female Pump Outlet QC - 4" Male Screw BSP 6" - Q160mm ES Part for Pump Outlet 110mm X 110mm Special TE for Twice line 4" - 110mm Elbow 4" - 110mm Male End Cap 4" - 110mm About for Air Release Valve Air Release Valve 2" Female 40HQ +20 DC Container Capacity</p> | |
| <p>Ultra irrigation kits. DCR80/2 Tractor PTO Pump - (Maximum 8 Bar - 110m³/hour) (2 Stage - Suction 4" - Outlet 3") 5" - Q125mm - QC Pipe System 5.8 Mt HDPE Pipe - PN8 (1 set Include 120pcs Pipe, Total 725-meter Pipeline) Suction Pipe 4" PVC - 101mm 8mt Roll Suction Valve - 4" - 101mm with 4 pcs Clamp For 125mm QC pipe x 90mm - 3" male Outlet 3" - 90mm Female Metal Hydrant Q125mm Gasket Q90mm Gasket 125mm Female Pump Outlet QC - 5" Male Screw BSP 5" - Q125mm ES Part for Pump Outlet 5" - 125mm Elbow 5" - 125mm Male End Cap 125mm / 110mm TE 4" - 110mm Abot 1" Outlet Air Release Valve 2" Female 20DC Container Capacity</p> |  |

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| <p>Ultra irrigation kits. 45 HP Diesel Motor pump - (8,5 Bar - 70m³/hour) (3 Stage - Suction 4" - Outlet 3") 5" - Q125mm - QC Pipe System 5.8 Mt HDPE Pipe - PN8 (1 set Include 125pcs Pipe, Total 725-meter Pipeline) Suction Pipe 4" PVC - 101mm 8mt Roll Suction Valve - 4" - 101mm with 4 pcs Clamp For 125mm QC pipe x 90mm - 3" male Outlet 3" - 90mm Female Metal Hydrant Q125mm Gasket Q90mm Gasket 125mm Female Pump Outlet QC - 5" Male Screw BSP 5" - Q125mm ES Part for Pump Outlet 5" - 125mm Elbow 5" - 125mm Male End Cap 125mm / 110mm TE 4" - 110mm Abot 1" Outlet Air Release Valve 2" Female 20DC Container Capacity</p> |  |
| <p>Master range,130 m³h, Motor IVECO N45 MSTA20.50 126 HP with Caprari pump MEC MG 80 4/3 A ELCOS control box CEM 250, hose length 600m, hose diameter 135mm Manual priming pump Hydraulic kit for jack, turntable rotation lifting trolley and anchor stabilizer legs, driven by the tractor's hydraulic system. Three-wheel trolley, symmetric, fixed body with weights Standard sprinkler with nozzles Larger wheels 385.65R22.5 Electronic controller kit DOSIDIS+, with solar panel and battery. Crank for winding in hose Pressure gauge in glycerine bath and gauge cock</p> |  |

Mini sky, length 200m, diameter hose 50mm, Turntable turret

Bellows drive or turbine drive two turbine size for 50 m³/hr

Automatic system for winding hose in at a constant speed

Tractor PTO for winding the hose in quickly without water - standard fitting on turbine machine, optional extra on bellows machine

Safety cut off system to stop wind-in at the end of the run or in the event of hose winding in unevenly

Winch trolley lifting system on Eco Rain machines, optional extra

Three-wheel trolley with adjustable carriage

Standard sprinkler with three nozzles

Rubber supply hose, high pressure, with couplers



Opti rain, length 230 m, hose diameter 70mm, turbine drive of 130m³/hr

Chassis in formed steel high resistance, U profile, with 2 wheels, or on demand, floating tandem axle on the models ST7 and ST8

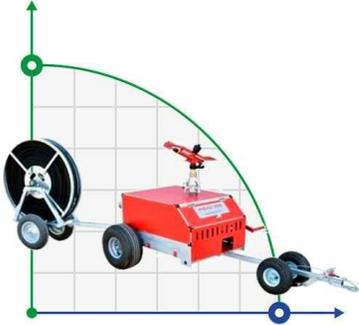
Adjustable wheel track to give greater stability in transport

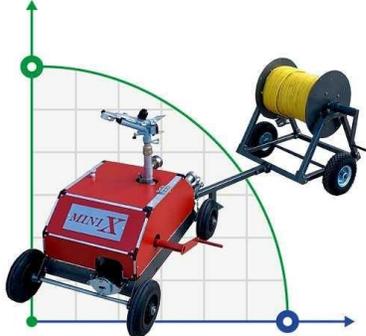
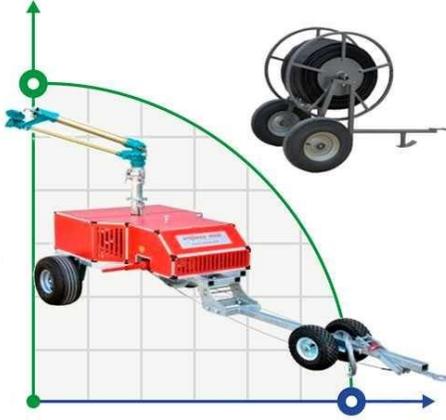
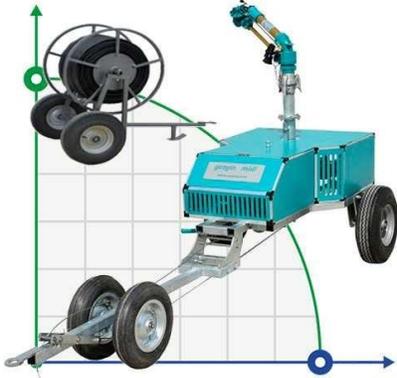
Winding diameter of the hose drum conforms to the 'CE' directives

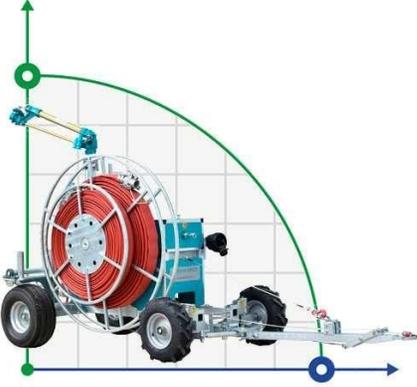
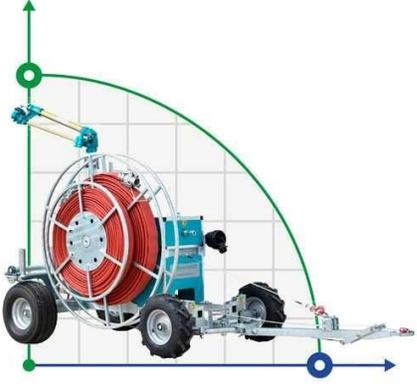
Easier PET winding-in by means of a big drive ring on the series ST3-4-15-6 & 7 and double transmission on the ST8 models

Turbimec driving system interchangeable for flows from 5 to 130 mc/h



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| <p>Oil bath gearbox with different drive speed ranges with PTO and automatic drum brakes incorporated Electronic system controlling the irrigation parameters DOSIDIS/TAKY Large range of optional accessories</p> | |
| <p>E- sky, 150 m³/h, hose length 520m hose diameter 90mm, Hydraulic kit for jack, turntable rotation lifting trolley and anchor stabilizer legs, driven by the tractor's hydraulic system. 4 meters rubber supply hose complete with couplers. Three wheels standard trolley, fixed body with weights. Standard sprinkler with nozzles. Agricultural wheels model 11.5-80/15.3 12PR. Pressure gauge in glycerine bath and gauge cock. Tachometer showing pull-in speed. Crank for winding in hose. Operator's manual and spare parts list.</p> |  |
| <p>Effective irrigation Length 140 Meter Hose Length And Inside Diameter 70 meter - 42mm Effective Spray Width 32 Meter - 46 Meter Cable Length, diameter 140 Meter - 4 mm Rain gun Type Standard Atom28 - Atom35 Optionally Flow Rate 7m³/h - 19 m³/h Recommended Working pressure 3.5 bar-8 bar Travel Speed 7meter/hour - 70meter/hour Travel Speed Can be Adjustable by Manuel Valve Manuel Hose Reel System 20' Container Loading Capacity 16 Weight (kg) 160 kg (With Hose and Hose reel) Box Dimension 155cm x 85cm x 105cm</p> |  |

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| <p>Effective irrigation Length 120 Meter Hose Length and Type 60 meter - Drag Hose Inside Diameter 32mm Effective Spray Width 28 Meter - 35 Meter Cable Length, diameter 120 Meter - 3 mm Rain gun Type Atom22 Flow Rate 3,5 m³/h - 7 m³/h Recommended Working pressure 3 bar-7 bar Travel Speed 19meter/hour - 100meter/hour Travel Speed Can be Adjustable by Nozzle & Pressure Manuel Hose Reel System 20' Container Loading Capacity 54 Weight (kg) 60 kg + 43 kg (Hose & hose reel) Box Dimension 92cm x 60cm x 55cm</p> |  |
| <p>Effective irrigation Length 200 Meter Hose Length And Inside Diameter 100 meter - 65mm Effective Spray Width 50 Meter - 75 Meter Cable Length, diameter 200 Meter - 4 mm Raingun Type JET50 Flow Rate 18 m³/h - 45 m³/h Recommended Working pressure 3,5 bar- 8 bar Travel Speed 8meter/hour - 100 meter/hour Travel Speed Can be Adjustable by Mauel Valve Manuel Hose Reel System 20' Container Loading Capacity 7 Box Dimension 1 154cm x 85 cm x 105cm (210 kg) Box Dimension 2 128cm X 95cm X 95cm (140kg)</p> |  |
| <p>Effective irrigation Length 200 Meter Hose Length And Inside Diameter 100 meter - 51mm Effective Spray Width 40 Meter - 65 Meter Cable Length, diameter 200 Meter - 4 mm Rain gun Type JET40 Flow Rate 12m³/h - 30 m³/h Recommended Working pressure 3 bar-7.5 bar Travel Speed 7meter/hour - 60 meter/hour Travel Speed Can be Adjustable by Manuel Valve Manuel Hose Reel System 20'</p> |  |

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| <p>Container Loading Capacity 7 Box Dimension 1 154cm x 85 cm x 105cm (210 kg) Box Dimension 2 128cm X 95cm X 95cm (140kg)</p> | |
| <p>Effective irrigation Length 200 Meter Hose Length and Inside Diameter 100meter-51mm Effective Spray Width 40 Meter - 65 Meter Cable Length, diameter 200 Meter - 4 mm Raingun Type JET50 Flow Rate 12m³/h - 30 m³/h Recommended Working pressure 3 bar-7.5 bar Tractor Operated Hose Rewind System Travel Speed 7meter/hour - 60 meter/hour 20' Container Loading Capacity 5 Weight (kg) 450 kg Box Dimension 220cm X 115 cm X 165 cm</p> |  <p>The diagram shows a tractor-mounted hose rewind system. A large red hose is wound on a reel. A green line indicates the effective irrigation path, starting from the reel and curving upwards and then downwards to a nozzle. A blue line with an arrow indicates the travel direction of the tractor. The system is mounted on a trailer with two large rear wheels and a hitch.</p> |
| <p>Effective irrigation Length 300 Meter Hose Length And Inside Diameter 150 meter - 51mm Effective Spray Width 40 Meter - 65 Meter Cable Length diameter 300 Meter - 4 mm Raingun Type JET50 Flow Rate 12m³/h - 30 m³/h Recommended Working pressure 3 bar-7.5 bar Travel Speed 7meter/hour - 50 meter/hour Tractor Operated Hose rewind System 20' Container Loading Capacity 5 Weight (kg) 500 kg Box Dimension 220cm X 115 cm X 165 cm</p> |  <p>The diagram shows a tractor-mounted hose rewind system, similar to the one above but with a longer hose. A large red hose is wound on a reel. A green line indicates the effective irrigation path, starting from the reel and curving upwards and then downwards to a nozzle. A blue line with an arrow indicates the travel direction of the tractor. The system is mounted on a trailer with two large rear wheels and a hitch.</p> |

4wheel towable Pivot with 2-Port Swivel, with Run light, Hydraulic Pumping Unit, Manual Control,

Span configuration: 6*48.16m (158 feet) long span ,16mm (65/8 inch) Galvanized Pipe

1*19.8m(65feet) overhang Assembly

14.9*24 Floation wheels with Painted rims

Planetary Drive Gear Option

NeslonR3000 Sprinklers with 68 bar (10PSI), Regulator Option

End Gun: SR 100

Flexible Hose Drop Option with Goosenecks

Inlet couplers and Connection Fittings



DETAILED ITEMS SPECIFICATIONS

SUPPLY AND INSTALLATION FOR SMALL SCALE IRRIGATION EQUIPMENT

| No | Item Description | Quantity | Unit price (FRW) |
|-----------|--|-----------------|-------------------------|
| 1 | Petrol Engine, suction lift 6-8 meters, Connection Size 2 inch, 50m Head, Q=18m ³ /hr | 1 | |
| 2 | Petrol Engine, Suction lift 6-8 Mtrs, Connection Size 2 inch, TDH = 20m, Q=12m ³ /hr | 1 | |
| 3 | Petrol Engine, Suction lift 6-8 Mtrs, Connection Size: 1.5 inch, TDH= 20m, Q= 12m ³ /hr | 1 | |
| 4 | Petrol Engine (KOSHIN), suction lift 7-8m, Connection Size 2-inch, Q= 37.2 m ³ /h @ TDH 27m | 1 | |
| 5 | Petrol Engine (KOSHIN), suction lift 7-8m, Connection Size: 3", Q= 63m ³ /h @ TDH 27m | 1 | |
| 6 | Petrol Engine (DAYLIFF), suction lift 7-8m, Connection Size: 2-inch, Q= 30m ³ /h, TDH= 50m | 1 | |

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| 7 | Petrol Engine (DAYLIFF), suction lift 7-8m, Connection Size: 2-inch, Q= 30m ³ /h, TDH= 30m | 1 | |
| 8 | Petrol Engine (DAYLIFF), suction lift 7-8m, Connection Size: 2-inch, Q= 18m ³ /h, TDH= 70m | 1 | |
| 9 | Petrol Engine (DAYLIFF), suction lift 7-8m, Connection Size: 2-inch, Q= 30m ³ /h, TDH= 70m | 1 | |
| 10 | Petrol Engine (WP20), suction lift 7-8m, Connection Size: 2-inch, Q= 30m ³ /h, TDH= 50m | 1 | |
| 11 | Petrol Engine, suction lift 7-8m, Connection Size: 3-inch, Q= 63 m ³ /h, TDH= 30m | 1 | |
| 12 | Petrol Engine, suction lift 7-8m, Connection Size: 2-inch, Q=35 m ³ /h, TDH 30m | 1 | |
| 13 | Petrol Engine, suction lift 6-8 m, Connection Size: 2-inch, Q= 30 m ³ /h, TDH= 70m | 1 | |
| 14 | Petrol Engine, suction lift 6-8m, Connection Size: 3-inch, Q= 40 m ³ /h, TDH= 80m | 1 | |
| 15 | Diesel Engine, suction lift 6- 8 m, 3 inch, TDH= 50m, Q= 23m ³ /h | 1 | |
| 16 | Diesel Engine, suction lift 6- 8 m, 3 inch, TDH= 50m, Q= 38m ³ /h | 1 | |
| 17 | Diesel Engine, suction lift 6- 8 m, 2 inch, TDH= 50m, Q= 28m ³ /h | 1 | |
| 18 | Diesel Engine, suction lift 6- 8 m, 3 inch, TDH= 22m, Q= 45m ³ /h | 1 | |
| 19 | Diesel Engine, suction lift 6- 8 m, 2 inch, TDH= 25m, Q= 30m ³ /h | 1 | |
| 20 | Diesel Engine, suction lift 6- 8 m, 2 inch, TDH= 60m, Q=30m ³ /h | 1 | |
| 21 | Diesel Engine, suction lift 7-8m, 3 inch, TDH 70m, Q= 38 m ³ /h | 1 | |
| 22 | Diesel Engine, suction lift 7-8m, 4 inch, TDH 105 m, Q= 60 m ³ /h | 1 | |
| 23 | Diesel Engine, suction lift 7-8m, 4 inch, TDH 250, Q= 10-20 m ³ /h | 1 | |
| 24 | Diesel Motor pump, with 17 HP, Pressure (Hm mss): 65, Capacity: 80 m ³ /h, Suction: 4'', Outlet: 4'' Female, starting model: Electric starter and manual | 1 | |
| 25 | Diesel Engine, suction lift 7-8m, TDH 250, Q= 30 m ³ /h, 52 HP | 1 | |
| 26 | Diesel Engine, suction lift 7-8m, TDH 150, Q= 30 m ³ /h, 23 HP | 1 | |
| 27 | 5 m Flexible suction Pipe (2'') with inside wire | 1 | |
| 28 | 5 m Flexible suction Pipe (3'') with inside wire | 1 | |
| 29 | 10 m Flexible suction Pipe (4'') with inside wire | 1 | |

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| 30 | Treadle pump complete with 7m lens suction pipe (32mm dia.) and foot valve Discharge 4000 liters/hr. @TDH 13m; suction lift 5-7m and delivery pipe of at least 15 m | 1 | |
| 31 | DC submersible pump + Accessories: Max Head: 80m, Max Flow: 6m ³ /h, Outlet: 50 mm, Current: 22 A, Power: 1300 W, Voltage: DC 60V | 1 | |
| 32 | DC submersible pump + Accessories: Max Head: 50m, Max Flow: 3m ³ /h, Outlet: 25 mm, Current: 25 A, Power: 600 W, Voltage: DC 24 V | 1 | |
| 33 | DC submersible pump + Accessories: Max Head: 10m, Max Flow: 6m ³ /h, Outlet: 32 mm, Current: 10 A, Power: 120 W, Voltage: DC 12 V | 1 | |
| 34 | Submersible solar pump System, Head max.40m, Flow rate max. 13 m ³ /h, power.1.8 kw or equivalent with 1.8 kw and accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector2 | 1 | |
| 35 | Submersible Solar pump System, Head max.45m, Flow rate max. 26 m ³ /h, Power.4 kw or equivalent with 4 kw and accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector2 | 1 | |
| 36 | Submersible Solar pump System, Head max.80m, Flow rate max.25m ³ /h, Power 8 kw or equivalent with 8 kw, accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector 2 | 1 | |
| 37 | Submersible Solar pump System, Head max. 100m, Flow rate max.39m ³ /h, power.15 kw or equivalent with 15 kw, accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector 2 | 1 | |
| 38 | Submersible Solar pump System, Head max. 120m, Flow rate max.43m ³ /h, power 21 kw or equivalent with 21 kw, accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector 2 | 1 | |
| 39 | Submersible solar pump System, Head max.200 m, Flow rate max.38m ³ /h, power 25 kw or equivalent with 25 kw, accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector 2 | 1 | |
| 40 | Submersible solar pump System, Head max. 200m, Flow rate max.109m ³ /h, power 60kw or equivalent with 60kw, accessories: well probe V2, Disconnect, Sun sensor Module, Surge Protector 2 | 1 | |
| 41 | AC Submersible pump + Controller + Accessories: Max Head: 80 m, Max Flow: 18m ³ /h, Outlet: 63 mm, Current: 7.9 A, Power: 3000 W, Voltage: AC 3×415 V | 1 | |
| 42 | AC Submersible pump + Controller + Accessories: Max Head: 100 m, Max Flow: 18m ³ /h, Outlet: 63 mm, Current: 10.2 A, Power: 4000 W, Voltage: AC 3×415 V | 1 | |

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| 43 | AC Submersible pump + Controller + Accessories: Max Head: 140 m, Max Flow: 18m ³ /h, Outlet: 63 mm, Current: 13.1 A, Power: 5500 W, Voltage: AC 3×415 V | 1 | |
| 44 | Solar pump Type AC, 4 szw 10-80-7.5 kw, Max Head 90 m, Rated Flow=28m ³ /hr, Power= 7.5KW, Solar Power 13.6 Kw, Size: 38 mm, Total Weight 1140 KG | 1 | |
| 45 | Solar pump Type AC, 6 szw 40-90-15 kw, Max Head 130 m, Rated Flow=59m ³ /hr, Power= 15 KW, Solar Power 26 Kw, Size: 850 mm, Total Weight 2240 KG | 1 | |
| 46 | Sunflower Solar Pump, Lift 10m; horizontal pumping over 100m. Pumps 2,000 litres/hour – over 10,000 litres per day. Irrigates 0.2-0.8 ha per day and pump. Est. 10 years lifespan with 12 months warrantee | 1 | |
| 47 | Sunlight pump, Q=45 l/min, TDH=40 m, pump type : positive displacement, complete accessories | 1 | |
| 48 | Electric Pump, TDH: 93 m, Q=45m ³ /s, 19.5KW | 1 | |
| 49 | Electric Pump, TDH: 120 m, Q=51m ³ /s, 27,5KW | 1 | |
| 50 | Electric Pump, TDH: 150 m, Q=36m ³ /s, 17.5KW | 1 | |
| 51 | Pump,Q= 2.4m ³ /h, TDH: 234 m, 1.5 KW | 1 | |
| 52 | Pump,Q= 3m ³ /h, TDH: 139 m, 1.1 KW | 1 | |
| 53 | Pump,Q= 4.2m ³ /h, TDH: 208 m, 2.2 KW | 1 | |
| 54 | Pump,Q= 12 m ³ /h, TDH: 200 m, 5.5 KW | 1 | |
| 55 | Pump,Q= 24m ³ /h, TDH: 125 m, 5.5 KW | 1 | |
| 56 | Layflat Pipe/Hose Pipe, 50 m, 4-inch, delivery pipe | 1 | |
| 57 | Layflat Pipe/Hose Pipe, 100 m, 4-inch, delivery pipe | 1 | |
| 58 | Layflat Pipe/Hose Pipe, 50 m, 3-inch, delivery pipe | 1 | |
| 59 | Layflat Pipe/Hose Pipe, 100 m, 3-inch, delivery pipe | 1 | |
| 60 | Layflat Pipe/Hose Pipe, 50m, 2-inch, delivery pipe | 1 | |
| 61 | Layflat Pipe/Hose Pipe, 100m, 2-inch, delivery pipe | 1 | |
| 62 | Layflat Pipe/Hose Pipe, 50m, 1.5-inch, delivery pipe | 1 | |
| 63 | Layflat Pipe/Hose Pipe, 100m, 1.5-inch, delivery pipe | 1 | |
| 64 | Hose pipes High Pressure resisting PN10, Quick Coupling 2 inch, easily connected to Rain guns, (30 m Length) | 1 | |
| 65 | Hose pipes High Pressure resisting PN8, Quick Coupling 2 inch, easily connected to Rain guns, (30 m Length) Quick Coupling 3 inch, easily connected to the houses | 1 | |
| 66 | Hose pipes High Pressure resisting PN10, Quick Coupling 3 inch, easily connected to Rain guns, (30 m Length) | 1 | |
| 67 | Outlet Hosepipe, 1inch internal diameter (25mm). 12 bar pressure per meter | 1 | |

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| 68 | Dam sheets 480m ² , The Tensile strength: $\geq 300\text{N/MM}^2$, The Tear strength: $\geq 18\text{N/MM}^2$; The Elongation at break: $\geq 394\%$; The Shrinkage: $\geq 0.04\%$; The bursting strength: $\geq 30\text{ DAN/CM}^2$, The UV treatment: 100%; The Recyclable: 100%; The Thickness: 0.9-1.0MM (One millimeter), made of HDPE Material | 1 | |
| 69 | Dam sheets 250m ² , The Tensile strength: $\geq 300\text{N/MM}^2$, The Tear strength: $\geq 18\text{N/MM}^2$; The Elongation at break: $\geq 394\%$; The Shrinkage: $\geq 0.04\%$; The bursting strength: $\geq 30\text{ DAN/CM}^2$, The UV treatment: 100%; The Recyclable: 100%; The Thickness: 0.9-1.0MM (One millimeter), made of HDPE Material | 1 | |
| 70 | Dam sheets 120m ² , The Tensile strength: $\geq 300\text{N/MM}^2$, The Tear strength: $\geq 18\text{N/MM}^2$; The Elongation at break: $\geq 394\%$; The Shrinkage: $\geq 0.04\%$; The bursting strength: $\geq 30\text{ DAN/CM}^2$, The UV treatment: 100%; The Recyclable: 100%; The Thickness: 0.9-1.0MM (One millimeter), made of HDPE Material | 1 | |
| 71 | Excavation and refilling per cubic meter in normal soil | 1 | |
| 72 | Excavation and refilling per cubic meter in water | 1 | |
| 73 | Excavation and refilling per cubic meter in rock soil | 1 | |
| 74 | Wire mesh (Senyenge) from 20×20 mesh to 30×30 mesh of 1.8 meters height per linear meter | 1 | |
| 75 | 480 m ³ Dam sheets Fencing, Galvanized Wire mesh from 20×20 mesh to 30×30 mesh of 1.8 meters height, fixed on metallic tube of 60/40 as main support and 40*40 as with 1.2 mm as second support casted in concrete to avoid collusion and door made in tubes | 1 | |
| 76 | 250 m ³ Dam sheets Fencing, Galvanized Wire mesh from 20×20 mesh to 30×30 mesh of 1.8 meters height fixed on metallic tube of 60/40 as main support and 40*40 as with 1.2 mm as second support casted in concrete to avoid collusion and door made in tubes | 1 | |
| 77 | 120 m ³ Dam sheets Fencing, Galvanized Wire mesh from 20×20 mesh to 30×30 mesh of 1.8 meters height | 1 | |
| 78 | Construction and lining of stone masonry per cubic meter | 1 | |
| 79 | Construction of Concrete masonry per cubic meter | 1 | |
| 80 | Construction of Reinforced Concrete masonry per cubic meter | 1 | |
| 81 | Construction of one cubic meter of non-reinforce concrete, Non-reinforced concrete of class B25 | 1 | |
| 82 | Construction of one cubic meter of reinforce concrete, Reinforced concrete as requested by the site of class B25 | 1 | |

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| 83 | Construction of burnt bricks bedded and jointed in cements and sand mortar per cubic meter | 1 | |
| 84 | Roof cover, Autoportant GB 30 per m2 | 1 | |
| 85 | Metallic tube 80/80, Thickness 1.5 | 1 | |
| 86 | Metallic tube 80/60, Thickness (1.5) | 1 | |
| 87 | Metallic tube 80/40, Thickness (1.5) | 1 | |
| 88 | Metallic tube 60/40, Thickness (1.5) | 1 | |
| 89 | Metallic tube 40/40, Thickness (1.5) | 1 | |
| 90 | 1,000 L Tank, Plastic Polyethylene | 1 | |
| 91 | 2000 L Tank, Plastic Polyethylene | 1 | |
| 92 | 3000 L Tank, Plastic Polyethylene | 1 | |
| 93 | 2,500L Tank, Plastic Polyethylene | 1 | |
| 94 | 5000L Tank, Plastic Polyethylene | 1 | |
| 95 | 10000L Tank, Plastic Polyethylene | 1 | |
| 96 | WATER BLADDER, 10000 ltrs, Base cloth: PES/PES; Mass per unit area/Total weight (approx.): 1257g/m ³ ; coating colour: Dull sand; Breaking strength; 4045N/5cm width; warp-way, (N) Breaking strength; 3940N/ 5cm width; weft-way, (N); Tear strength: warp-way, 609N. Tear strength: weft-way, 720N; Adhesion 100N/5cm; thickness, (1.02mm). Temperature resistance -30° to +70°C; color: army green camouflage; special properties: special quality for contact potable water. | 1 | |
| 97 | WATER BLADDER, 20000 ltrs, Base cloth: PES/PES; Mass per unit area/Total weight (approx.): 1257g/m ³ ; coating colour: Dull sand; Breaking strength; 4045N/5cm width; warp-way, (N) Breaking strength; 3940N/ 5cm width; weft-way, (N); Tear strength: warp-way, 609N. Tear strength: weft-way, 720N; Adhesion 100N/5cm; thickness, (1.02mm). Temperature resistance -30° to +70°C; color: army green camouflage; special properties: special quality for contact potable water. | 1 | |
| 98 | Medium volume Rain gun (1-1/4inch inlet with discharge of 3lps (10.8m ³ /hr) and radius of 22m; fitted with nozzle of 12mm, Body of brass metal including extra two nozzles of 10mm and 14mm) | 1 | |
| 99 | Rain gun stand (1-1/4-inch riser at 2m height mounted on telescopic legs Body manufacture from G.I) | 1 | |
| 100 | Big Rain gun (Galvanized with 2-inch inlet and discharge of 20m ³ /hr at radius of 40m) | 1 | |
| 101 | Big Rain gun stand (Threaded galvanized of 2-inch inlet with 2m riser and 2 tyre | 1 | |
| 102 | HDPE Quick coupling pipes, PN 10 (Diameter 75mm, Pressure rating 6BarsMaterial HDPE conforming to ISO4427, Quick coupling pipe fitted with pressure tight seal lips) | 1 | |

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| 103 | HDPE Quick coupling pipes, PN 10 (Diameter 90mm, Pressure rating 6BarsMaterial HDPE conforming to ISO4427, Quick coupling pipe fitted with pressure tight seal lips) | 1 | |
| 104 | Light steel Latch coupling pipes, PN 10 (Diameter 75mm, pressure rating 6bars Light galvanized steel, anti-corrosive with latch type coupling with seal, 6m lens pieces) | 1 | |
| 105 | Light steel latch coupling pipes (Diameter 90mm, pressure rating 6bars Light galvanized steel, anti-corrosive with latch type coupling with seals; 6m lens piece) | 1 | |
| 106 | HDPE QC 90-degree bend fittings (75mm) (Diameter 75mm, Quick coupling type HDPE to ISO4427 standard) | 1 | |
| 107 | HDPE QC 90-degree bend fittings (90mm) (Diameter 90mm quick coupling HDPE to ISO4427 standard) | 1 | |
| 108 | HDPE QC Tee pieces (75mm) (Diameter 75mm quick coupling type HDPE to ISO4427 standard) | 1 | |
| 109 | HDPE QC Tee pieces (90mm) (Diameter 90mm quick coupling type HDPE to ISO4427 standard) | 1 | |
| 110 | HDPE QC End caps (75mm) (Diameter 75mm HDPE to ISO4427 standard) | 1 | |
| 111 | HDPE QC End caps (90mm) (Diameter 90mm HDPE to ISO4427 standard) | 1 | |
| 112 | Light steel Latch type 90 deg. bend (75mm) (Diameter 75mm latch type Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 113 | Light steel Latch type 90 deg. bend (90mm) (Diameter 90mm latch type Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 114 | Light steel Latch type Tee pieces (75mm) (Diameter 75mm Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 115 | Light steel Latch type Tee pieces (90mm) (Diameter 90mmLight galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 116 | Light steel latch type End caps (75mm) (Diameter 75mm Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 117 | Light steel latch type End caps (90mm) (Diameter 90mm Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 118 | HDPE QC End caps (75mm) (Diameter 75mm HDPE to ISO4427 standard) | 1 | |
| 119 | Light steel latch type End caps (75mm) (Diameter 75mm Light galvanized steel, anti-corrosive with latch type coupling with seals) | 1 | |
| 120 | G.I reducers 2-1/2-inch x1-1/4inch (Galvanized Iron coated) | 1 | |

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| 121 | QC pump connectors 3 inch (Galvanized Iron body) | 1 | |
| 122 | Gate Valves 2-1/2 inch (Brass body) | 1 | |
| 123 | G.I nipples (0.3m lens) 2-1/2 inch (Galvanized Iron body) | 1 | |
| 124 | G.I nipples (0.3m lens) 2 inch (Galvanized Iron body) | 1 | |
| 125 | Quick Coupling HDPE Pipes,6 Mtrs (PN4 - 63mm) | 1 | |
| 126 | Quick Coupling HDPE Pipes,6 Mtrs (PN4 - 75mm) | 1 | |
| 127 | Quick Coupling HDPE Pipes,6 Mtrs (PN4 - 90mm) | 1 | |
| 128 | Quick Coupling HDPE Pipes,6 Mtrs (PN6 - 63mm) | 1 | |
| 129 | Quick Coupling HDPE Pipes,6 Mtrs (PN6 - 75mm) | 1 | |
| 130 | Quick Coupling HDPE Pipes,6 Mtrs (PN6 - 90mm) | 1 | |
| 131 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN4 - 63mm) | 1 | |
| 132 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN4 - 75mm) | 1 | |
| 133 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN4 - 90mm) | 1 | |
| 134 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN6 - 63mm) | 1 | |
| 135 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN6 - 75mm) | 1 | |
| 136 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN6 - 90mm) | 1 | |
| 137 | Rain gun Stand 1 Mtr riser | 1 | |
| 138 | Rain gun Stand 2 Mtr riser | 1 | |
| 139 | QPC HDPE Bend/Elbow (PN6 63mm) | 1 | |
| 140 | QPC HDPE Bend/Elbow (PN6 75mm) | 1 | |
| 141 | QPC HDPE Bend/Elbow (PN6 90mm) | 1 | |
| 142 | QPC HDPE Tee (PN6 63mm) | 1 | |
| 143 | QPC HDPE Tee (PN6 75mm) | 1 | |
| 144 | QPC HDPE Tee (PN6 90 mm) | 1 | |
| 145 | QPC HDPE End Cap (PN6 63mm) | 1 | |
| 146 | QPC HDPE End Cap (PN6 75mm) | 1 | |
| 147 | QPC HDPE End Cap (PN 6 90mm) | 1 | |
| 148 | Latch Type HDPE Bend/Elbow (PN6 63mm) | 1 | |
| 149 | Latch Type HDPE Bend/Elbow (PN6 75mm) | 1 | |
| 150 | Latch Type HDPE Bend/Elbow (PN6 90mm) | 1 | |
| 151 | Latch Type HDPE Tee (PN6 63mm) | 1 | |
| 152 | Latch Type HDPE Tee (PN6 75mm) | 1 | |
| 153 | Latch Type HDPE Tee (PN6 90mm) | 1 | |
| 154 | Latch Type HDPE End Cap (PN6 63mm) | 1 | |

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| 155 | Latch Type HDPE End Cap (PN6 75mm) | 1 | |
| 156 | Latch Type HDPE End Cap (PN6 90 mm) | 1 | |
| 157 | QPC Pump Connector (PN6 63mm) | 1 | |
| 158 | QPC Pump Connector (PN6 75mm) | 1 | |
| 159 | QPC Pump Connector (PN6 90mm) | 1 | |
| 160 | Latch Type Pump Connector (PN6 63mm) | 1 | |
| 161 | Latch Type Pump Connector (PN6 75mm) | 1 | |
| 162 | Latch Type Pump Connector (PN6 90mm) | 1 | |
| 163 | Metallic gate valve (1 inch) | 1 | |
| 164 | Metallic gate valve (1.5 inch) | 1 | |
| 165 | Metallic Gate Valve (63mm) | 1 | |
| 166 | Metallic Gate Valve (75mm) | 1 | |
| 167 | Metallic Gate Valve (90mm) | 1 | |
| 168 | Metallic Gate Valve (110 mm) | 1 | |
| 169 | Supply Flanges Adaptors, D63mm | 1 | |
| 170 | Supply Flanges Adaptors, D75mm | 1 | |
| 171 | Supply Flanges Adaptors, D90mm | 1 | |
| 172 | Supply Flanges Adaptors, D110mm | 1 | |
| 173 | GI Nipple,0.3 Mtr long (63mm) | 1 | |
| 174 | GI Nipple,0.3 Mtr long (75mm) | 1 | |
| 175 | GI Nipple,0.3 Mtr long (90mm) | 1 | |
| 176 | GI Nipple,0.3 Mtr long (110 mm) | 1 | |
| 177 | Light Steel Latch Coupling HDPE Pipes,6 Mtrs (PN10 50mm) | 1 | |
| 178 | GI Elbow1-1/4 by 2,5 (DN4) | 1 | |
| 179 | Latch Type HDPE Tee (PN10 50mm) | 1 | |
| 180 | GI Reducer (4 by 3) | | |
| 181 | GI Reducer (3 by 2) | 1 | |
| 182 | GI Reducer (3 by 2.5) | 1 | |
| 183 | G.I PIPE DN12 1" | 1 | |
| 184 | G.I PIPE DN 12 1.5" | 1 | |
| 185 | G.I PIPE DN 12 2" | 1 | |
| 186 | G.I PIPE DN12 3" | 1 | |
| 187 | Non-Return Valve (50mm) | 1 | |
| 188 | Non-Return Valve (63mm) | 1 | |
| 189 | Non-Return Valve (75mm) | 1 | |
| 190 | Non-Return Valve (90mm) | 1 | |
| 191 | Non-Return Valve (110mm) | 1 | |
| 192 | Metallic Fertilizer Tank (30 ltrs) | 1 | |
| 193 | Metallic Fertilizer Tank (60 ltrs) | 1 | |
| 194 | Metallic Fertilizer Tank (90 ltrs) | 1 | |

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| 195 | Glyserine Pressure Gauge | 1 | |
| 196 | Flush Valve (50mm) | 1 | |
| 197 | Flush Valve (63mm) | 1 | |
| 198 | Flush Valve (75mm) | 1 | |
| 199 | Flush Valve (90mm) | 1 | |
| 200 | Rubber Grommet (12/16mm) | 1 | |
| 201 | Start Connector/Take off (12mm) | 1 | |
| 202 | Start Connector/Take off (16mm) | 1 | |
| 203 | Straight Connector/Joinner (12mm) | 1 | |
| 204 | Straight Connector/Joinner (16mm) | 1 | |
| 205 | End Cap (12mm) | 1 | |
| 206 | End Cap (16mm) | 1 | |
| 207 | Joinner/ connector/reducer (12 to 16mm) | 1 | |
| 208 | PVC Pipes, PN6 (40mm) | 1 | |
| 209 | PVC Pipes, PN6 (50mm) | 1 | |
| 210 | PVC Pipes, PN6 (63mm) | 1 | |
| 211 | PVC Pipes, PN6 (75mm) | 1 | |
| 212 | PVC Pipes, PN6 (90mm) | 1 | |
| 213 | PVC Pipes, PN6 (110mm) | 1 | |
| 214 | PVC Pipes, PN6 (140mm) | 1 | |
| 215 | PVC Pipes, PN6 (160mm) | 1 | |
| 216 | PVC Pipe, PN 10 (50mm) | 1 | |
| 217 | PVC Pipe, PN 10 (63mm) | 1 | |
| 218 | PVC Pipe, PN 10 (75mm) | 1 | |
| 219 | PVC Pipe, PN 10 (90mm) | 1 | |
| 220 | PVC Pipe, PN 10 (110mm) | 1 | |
| 221 | PVC Pipe, PN 10 (140mm) | 1 | |
| 222 | PVC Pipe, PN 10 (160mm) | 1 | |
| 223 | HDPE Pipe, PN4 (50mm) | 1 | |
| 224 | HDPE Pipe, PN4 (63mm) | 1 | |
| 225 | HDPE Pipe, PN4 (75mm) | 1 | |
| 226 | HDPE Pipe, PN4 (90mm) | 1 | |
| 227 | HDPE Pipe, PN4 (110mm) | 1 | |
| 228 | HDPE Pipe, PN6 (50mm) | 1 | |
| 229 | HDPE Pipe, PN6 (63mm) | 1 | |
| 230 | HDPE Pipe, PN6 (75mm) | 1 | |
| 231 | HDPE Pipe, PN6 (90mm) | 1 | |
| 232 | HDPE Pipe, PN6 (110mm) | 1 | |
| 233 | Online/Plain Lateral (12mm) | 1 | |
| 234 | Online/Plain Lateral (16mm) | 1 | |

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| 235 | Inline Lateral / Dripline, 2LPH, 30cm, (Thickness 0.4mm) 12mm | 1 | |
| 236 | Inline Lateral / Dripline, 2LPH, 40cm, (Thickness 0.4mm) 12mm | 1 | |
| 237 | Inline Lateral / Dripline, 2LPH, 50cm, (Thickness 0.4mm) 12mm | 1 | |
| 238 | Inline Lateral / Dripline, 2LPH, 60cm, (Thickness 0.4mm) 12mm | 1 | |
| 239 | Inline Lateral / Dripline, 2LPH, 30cm, (Thickness 0.4mm) 16mm | 1 | |
| 240 | Inline Lateral / Dripline, 2LPH, 40cm, (Thickness 0.4mm) 16mm | 1 | |
| 241 | Inline Lateral / Dripline, 2LPH, 50cm, (Thickness 0.4mm) 16mm | 1 | |
| 242 | Inline Lateral / Dripline, 2LPH, 60cm, (Thickness 0.4mm) 16mm | 1 | |
| 243 | Inline Lateral / Dripline, 4LPH, 30cm, (Thickness 0.4mm) 12mm | 1 | |
| 244 | Inline Lateral / Dripline, 4LPH, 40cm, (Thickness 0.4mm) 12mm | 1 | |
| 245 | Inline Lateral / Dripline, 4LPH, 50cm, (Thickness 0.4mm) 12mm | 1 | |
| 246 | Inline Lateral / Dripline, 4LPH, 60cm, (Thickness 0.4mm) 12mm | 1 | |
| 247 | Inline Lateral / Dripline, 4LPH, 30cm, (Thickness 0.4mm) 16mm | 1 | |
| 248 | Inline Lateral / Dripline, 4LPH, 40cm, (Thickness 0.4mm) 16mm | 1 | |
| 249 | Inline Lateral / Dripline, 4LPH, 50cm, (Thickness 0.4mm) 16mm | 1 | |
| 250 | Inline Lateral / Dripline, 4LPH, 60cm, (Thickness 0.4mm) 16mm | 1 | |
| 251 | Online Drippers / Emitters / Wood Peckers (4 LPH) | 1 | |
| 252 | Online Drippers / Emitters / Wood Peckers (8 LPH) | 1 | |
| 253 | Online Drippers / Emitters / Wood Peckers (14 LPH) | 1 | |
| 254 | Online Drippers / Emitters / Wood Peckers (16 LPH) | 1 | |
| 255 | 4 Way Barb Connector | 1 | |
| 256 | 2 Way Barb Connector | 1 | |
| 257 | Polytube for barb connectors | 1 | |
| 258 | Drip Kit for 500 SQ.Mtr (500m ²) | 1 | |
| 259 | Drip Kit for 1000 SQ.Mtr (1000m ²) | 1 | |
| 260 | Drip Kit for 2000 SQ.Mtr (2000m ²) | 1 | |
| 261 | Drip Kit for 4000 SQ.Mtr (4000m ²) | 1 | |
| 262 | Spray Kit 500 SQ.Mtr (40mm, 350micro) 500m ² | 1 | |

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| 263 | Spray Kit 500 SQ.Mtr (40mm, 400micros) 500m2 | 1 | |
| 264 | Spray Kit 500 SQ.Mtr (40mm, 450micros) 500 m2 | 1 | |
| 265 | Spray Kit 500 SQ.Mtr (50mm, 350micros) 500m2 | 1 | |
| 266 | Spray Kit 500 SQ.Mtr (50mm, 400micros) 500m2 | 1 | |
| 267 | Spray Kit 500 SQ.Mtr (50mm, 450micros) 500m2 | 1 | |
| 268 | Mini Spray Kit 1000 SQ.Mtr (32mm, 350micros) 1000m2 | 1 | |
| 269 | Mini Spray Kit 1000 SQ.Mtr (20mm, 250micros) 1000m2 | 1 | |
| 270 | Metallic Stand Height 1.5 Mtrs (500 LTR) | 1 | |
| 271 | Metallic Stand Height 1.5 Mtrs (1000 LTR) | 1 | |
| 272 | Concrete/Stone Masonry Structure for Tank (L-, H-, W-) 5000 LTR | 1 | |
| 273 | Concrete/Stone Masonry Structure for Tank (L-, H-, W-) 10000 LTR | 1 | |
| 274 | HDPE Pipe, PN10 (63mm) | 1 | |
| 275 | HDPE Pipe, PN10 (75mm) | 1 | |
| 276 | HDPE Pipe, PN10 (90mm) | 1 | |
| 277 | HDPE Pipe, PN10 (110mm) | 1 | |
| 278 | HDPE Pipe, PN10 (32mm) | 1 | |
| 279 | HDPE Pipe, PN10 (25mm) | 1 | |
| 280 | HDPE Pipe, PN10 (50mm) | 1 | |
| 281 | HDPE Pipe, PN10 (140mm) | 1 | |
| 282 | HDPE PIPE PN10,200mm | 1 | |
| 283 | HDPE PIPE PN10,250mm | 1 | |
| 284 | HDPE PIPE PN10,300mm | 1 | |
| 285 | HDPE PIPE PN10,350mm | 1 | |
| 286 | HDPE PIPE PN10,400mm | 1 | |
| 287 | HDPE PIPE PN10,450mm | 1 | |
| 288 | HDPE Pipe, PN12.5 (63mm) | 1 | |
| 289 | HDPE Pipe, PN12.5 (90mm) | 1 | |
| 290 | HDPE Pipe, PN12.5 (110mm) | 1 | |
| 291 | HDPE Pipe, PN12.5 (32mm) | 1 | |
| 292 | HDPE Pipe, PN12.5 (25mm) | 1 | |
| 293 | HDPE Pipe, PN12.5 (50mm) | 1 | |
| 294 | HDPE Pipe, PN12.5 (140mm) | 1 | |
| 295 | Cylindrical plain drip lateral tube 12mm (800 micron) | 1 | |
| 296 | Cylindrical plain drip lateral tube 16mm (800 micron) | 1 | |
| 297 | Cylindrical plain drip lateral tube 20mm (800 micron) | 1 | |
| 298 | Cylindrical plain drip lateral tube 12mm (1100 micron) | 1 | |
| 299 | Cylindrical plain drip lateral tube 16mm (1100 micron) | 1 | |
| 300 | Cylindrical plain drip lateral tube 20mm (1100 micron) | 1 | |
| 301 | Grommet 12mm | 1 | |

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| 302 | Grommet 16mm | 1 | |
| 303 | Grommet 20mm | 1 | |
| 304 | Take off barbered connector 12mm | 1 | |
| 305 | Take off barbered connector 16mm | 1 | |
| 306 | Take off barbered connector 120mm | 1 | |
| 307 | Straight barbered connector 12mm | 1 | |
| 308 | Straight barbered connector 16mm | 1 | |
| 309 | Straight barbered connector 20mm | 1 | |
| 310 | Straight barbered connector with valve 16mm | 1 | |
| 311 | Elbow barbered connector 16mm | 1 | |
| 312 | Tee barbered connector 16mm | 1 | |
| 313 | End barbered cap 16mm | 1 | |
| 314 | Drill bit (stainless steel) 16mm | 1 | |
| 315 | On-line dripper (Non-pressure compensator dripper) 4 LPH | 1 | |
| 316 | On-line dripper (Non-pressure compensator dripper) 8 LPH | 1 | |
| 317 | On-line dripper (pressure compensator dripper) 4 LPH | 1 | |
| 318 | On-line dripper (pressure compensator dripper) 48 LPH | 1 | |
| 319 | Tee PN4 (40mm) | 1 | |
| 320 | Tee PN4 (50mm) | 1 | |
| 321 | Tee PN4 (63mm) | 1 | |
| 322 | Tee PN4 (75mm) | 1 | |
| 323 | Tee PN4 (90mm) | 1 | |
| 324 | Tee PN4 (110mm) | 1 | |
| 325 | Tee PN4 (140mm) | 1 | |
| 326 | Tee PN4 (160mm) | 1 | |
| 327 | Tee PN6 (40mm) | 1 | |
| 328 | Tee PN6 (50mm) | 1 | |
| 329 | Tee PN6 (63mm) | 1 | |
| 330 | Tee PN6 (75mm) | 1 | |
| 331 | Tee PN6 (90mm) | 1 | |
| 332 | Tee PN6 (110mm) | 1 | |
| 333 | Tee PN10 (40mm) | 1 | |
| 334 | Tee PN10 (50mm) | 1 | |
| 335 | Tee PN10 (63mm) | 1 | |
| 336 | Tee PN10 (75mm) | 1 | |
| 337 | Tee PN10 (90mm) | 1 | |
| 338 | Tee PN10 (110mm) | 1 | |
| 339 | Tee PN6 (110*110*90) mm | 1 | |
| 340 | Tee PN6 (110*110*75) mm | 1 | |
| 341 | Tee PN6 (110*110*63) mm | 1 | |
| 342 | Tee PN6 (90*90*75) mm | 1 | |

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| 343 | Tee PN6 (90*90*63) mm | 1 | |
| 344 | Tee PN6 (75*75*63) mm | 1 | |
| 345 | Tee PN6 (75*75*50) mm | 1 | |
| 346 | Tee PN6 (50*50*40) mm | 1 | |
| 347 | Elbow PN4 (40mm) | 1 | |
| 348 | Elbow PN4 (50mm) | 1 | |
| 349 | Elbow PN4 (63mm) | 1 | |
| 350 | Elbow PN4 (75mm) | 1 | |
| 351 | Elbow PN4 (90mm) | 1 | |
| 352 | Elbow PN4 (110mm) | 1 | |
| 353 | Elbow PN6 (40mm) | 1 | |
| 354 | Elbow PN6 (50mm) | 1 | |
| 355 | Elbow PN6 (63mm) | 1 | |
| 356 | Elbow PN6 (75mm) | 1 | |
| 357 | Elbow PN6 (90mm) | 1 | |
| 358 | Elbow PN6 (110mm) | 1 | |
| 359 | Elbow PN10 (40mm) | 1 | |
| 360 | Elbow PN10 (50mm) | 1 | |
| 361 | Elbow PN10 (63mm) | 1 | |
| 362 | Elbow PN10 (75mm) | 1 | |
| 363 | Elbow PN10 (90mm) | 1 | |
| 364 | Elbow PN10 (110mm) | 1 | |
| 365 | PVC Reducing Bush PN4 (40*50) mm | 1 | |
| 366 | PVC Reducing Bush PN4 (50*63) mm | 1 | |
| 367 | PVC Reducing Bush PN4 (63*75) mm | 1 | |
| 368 | PVC Reducing Bush PN4 (75*90) mm | 1 | |
| 369 | PVC Reducing Bush PN4 (63*40) mm | 1 | |
| 370 | PVC Reducing Bush PN4 (75*50) mm | 1 | |
| 371 | PVC Reducing Bush PN4 (90*110) mm | 1 | |
| 372 | PVC Reducing Bush PN4 (90*63) mm | 1 | |
| 373 | PVC Reducing Bush PN4 (90*50) mm | 1 | |
| 374 | PVC Reducing Bush PN4 (110*75) mm | 1 | |
| 375 | PVC Reducing Bush PN4 (110*63) mm | 1 | |
| 376 | PVC Reducing Bush PN6 (40*50) mm | 1 | |
| 377 | PVC Reducing Bush PN6 (50*63) mm | 1 | |
| 378 | PVC Reducing Bush PN6 (63*75) mm | 1 | |
| 379 | PVC Reducing Bush PN6 (75*90) mm | 1 | |
| 380 | PVC Reducing Bush PN6 (63*40) mm | 1 | |
| 381 | PVC Reducing Bush PN6 (75*50) mm | 1 | |
| 382 | PVC Reducing Bush PN6 (90*110) mm | 1 | |
| 383 | PVC Reducing Bush PN6 (90*63) mm | 1 | |

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| 384 | PVC Reducing Bush PN6 (90*50) mm | 1 | |
| 385 | PVC Reducing Bush PN6 (110*75) mm | 1 | |
| 386 | PVC Reducing Bush PN6 (110*63) mm | 1 | |
| 387 | PVC Reducing Bush PN10 (40*50) mm | 1 | |
| 388 | PVC Reducing Bush PN10 (50*63) mm | 1 | |
| 389 | PVC Reducing Bush PN10 (63*75) mm | 1 | |
| 390 | PVC Reducing Bush PN10 (75*90) mm | 1 | |
| 391 | PVC Reducing Bush PN10 (63*40) mm | 1 | |
| 392 | PVC Reducing Bush PN10 (75*50) mm | 1 | |
| 393 | PVC Reducing Bush PN10 (90*110) mm | 1 | |
| 394 | PVC Reducing Bush PN10 (90*63) mm | 1 | |
| 395 | PVC Reducing Bush PN10 (90*50) mm | 1 | |
| 396 | PVC Reducing Bush PN10 (110*75) mm | 1 | |
| 397 | PVC Reducing Bush PN10 (110*63) mm | 1 | |
| 398 | Elbow - 45 Degrees PN4 (50mm) | 1 | |
| 399 | Elbow - 45 Degrees PN4 (63mm) | 1 | |
| 400 | Elbow - 45 Degrees PN4 (75mm) | 1 | |
| 401 | Elbow - 45 Degrees PN4 (90mm) | 1 | |
| 402 | Tail Piece with metal Flange 50mm | 1 | |
| 403 | Tail Piece with metal Flange 63mm | 1 | |
| 404 | Tail Piece with metal Flange 75mm | 1 | |
| 405 | Tail Piece with metal Flange 90mm | 1 | |
| 406 | Tail Piece with metal Flange 110mm | 1 | |
| 407 | PVC Solvent/Glue 250 Gms | 1 | |
| 408 | PVC Solvent/Glue 500 Gms | 1 | |
| 409 | PVC Solvent/Glue 1kg | 1 | |
| 410 | Female Threaded Adapter PN4 (40mm) | 1 | |
| 411 | Female Threaded Adapter PN4 (50mm) | 1 | |
| 412 | Female Threaded Adapter PN4 (63mm) | 1 | |
| 413 | Female Threaded Adapter PN4 (75mm) | 1 | |
| 414 | Female Threaded Adapter PN4 (90mm) | 1 | |
| 415 | Female Threaded Adapter PN4 (110mm) | 1 | |
| 416 | Female Threaded Adapter PN6 (40mm) | 1 | |
| 417 | Female Threaded Adapter PN6 (50mm) | 1 | |
| 418 | Female Threaded Adapter PN6 (63mm) | 1 | |
| 419 | Female Threaded Adapter PN6 (75mm) | 1 | |
| 420 | Female Threaded Adapter PN6 (90mm) | 1 | |
| 421 | Female Threaded Adapter PN6 (110mm) | 1 | |
| 422 | Male Threaded Adapter PN4 (40mm) | 1 | |
| 423 | Male Threaded Adapter PN4 (50mm) | 1 | |
| 424 | Male Threaded Adapter PN4 (63mm) | 1 | |

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| 425 | Male Threaded Adapter PN4 (75mm) | 1 | |
| 426 | Male Threaded Adapter PN4 (90mm) | 1 | |
| 427 | Male Threaded Adapter PN4 (110mm) | 1 | |
| 428 | Male Threaded Adapter PN6 (40mm) | 1 | |
| 429 | Male Threaded Adapter PN6 (50mm) | 1 | |
| 430 | Male Threaded Adapter PN6 (63mm) | 1 | |
| 431 | Male Threaded Adapter PN6 (75mm) | 1 | |
| 432 | Male Threaded Adapter PN6 (90mm) | 1 | |
| 433 | Male Threaded Adapter PN6 (110mm) | 1 | |
| 434 | HDPE reduce connectors PN10 (25 by 32mm) | 1 | |
| 435 | HDPE reduce connectors PN10 (32 by 50mm) | 1 | |
| 436 | HDPE reduce connectors PN10 (50 by 63mm) | 1 | |
| 437 | HDPE reduce connectors PN10 (63 by 75mm) | 1 | |
| 438 | HDPE reduce connectors PN10 (75 by 90mm) | 1 | |
| 439 | HDPE reduce connectors PN10 (90 by 110mm) | 1 | |
| 440 | HDPE reduce connectors PN10 (110 by 140mm) | 1 | |
| 441 | HDPE reduce connectors PN10 (140 by 160mm) | 1 | |
| 442 | Tee HDPE type or polyester PN10 (40*40*40) mm | 1 | |
| 443 | Tee HDPE type or polyester PN10 (50*50*50) mm | 1 | |
| 444 | Tee HDPE type or polyester PN10 (63*63*63) mm | 1 | |
| 445 | Tee HDPE type or polyester PN10 (75*75*75) mm | 1 | |
| 446 | Tee HDPE type or polyester PN10 (90*90*90) mm | 1 | |
| 447 | Tee HDPE type or polyester PN10 (110*110*110) mm | 1 | |
| 448 | HDPE connectors Female and Male PN10 (40*40) mm | 1 | |
| 449 | HDPE connectors Female and Male PN10 (50*50) mm | 1 | |
| 450 | HDPE connectors Female and Male PN10 (63*63) mm | 1 | |
| 451 | HDPE connectors Female and Male PN10 (75*75) mm | 1 | |
| 452 | HDPE connectors Female and Male PN10 (90*90) mm | 1 | |
| 453 | HDPE connectors Female and Male PN10 (110*110) mm | 1 | |
| 454 | Tee HDPE type or polyerene PN10 (110*110*90) mm | 1 | |
| 455 | Tee HDPE type or polyerene PN10 (110*110*75) mm | 1 | |
| 456 | Tee HDPE type or polyerene PN10 (110*110*63) mm | 1 | |
| 457 | Tee HDPE type or polyerene PN10 (90*90*75) mm | 1 | |
| 458 | Tee HDPE type or polyerene PN10 (90*90*63) mm | 1 | |
| 459 | Tee HDPE type or polyerene PN10 (75*75*63) mm | 1 | |
| 460 | Tee HDPE type or polyerene PN10 (75*75*50) mm | 1 | |
| 461 | Tee HDPE type or polyerene PN10 (50*50*40) mm | 1 | |
| 462 | Tee HDPE type or polyerene PN10 (90mm*1) | 1 | |
| 463 | Tee HDPE type or polyerene PN10 (110mm*1) | 1 | |
| 464 | Gate valve of HDPE type or polyerene PN10 (25mm) | 1 | |
| 465 | Gate valve of HDPE type or polyerene PN10 (32mm) | 1 | |

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| 466 | Gate valve of HDPE type or polyerene PN10 (40mm) | 1 | |
| 467 | Gate valve of HDPE type or polyerene PN10 (50mm) | 1 | |
| 468 | Gate valve of HDPE type or polyerene PN10 (63mm) | 1 | |
| 469 | Gate valve of HDPE type or polyerene PN10 (75mm) | 1 | |
| 470 | Gate valve of HDPE type or polyerene PN10 (90mm) | 1 | |
| 471 | Gate valve of HDPE type or polyerene PN10 (110mm) | 1 | |
| 472 | Gate valve of HDPE type or polyerene PN10 (125mm) | 1 | |
| 473 | Gate valve of HDPE type or polyerene PN10 (140mm) | 1 | |
| 474 | First 20 m drilling (210mm diameter and 200mm length, with flashing water as compressor or airlift) (Casing pipe of 140mm and at least 50 cm length of holes of 2mm, gravel also should be used to facilitate infiltration) | 1 | |
| 475 | 1 Meter drilled after 50 m depth (210mm diameter and 200mm length, with flashing water as compressor or airlift) (Casing pipe of 140mm and at least 50 cm length of holes of 2mm, gravel also should be used to facilitate infiltration) | 1 | |
| 476 | Complete 20 m drilling with submersible pump kit (210mm diameter and 200mm length, with flashing water as compressor or airlift) (Casing pipe of 140mm and at least 50 cm length of holes of 2mm, gravel also should be used to facilitate infiltration) | 1 | |
| 477 | Complete 50 m drilling with submersible pump kit (210mm diameter and 200mm length, with flashing water as compressor or airlift) (Casing pipe of 140mm and at least 50 cm length of holes of 2mm, gravel also should be used to facilitate infiltration) | 1 | |
| 478 | More than 50 m drilling with submersible pump kit (210mm diameter and 200mm length, with flashing water as compressor or airlift) (Casing pipe of 140mm and at least 50 cm length of holes of 2mm, gravel also should be used to facilitate infiltration) | 1 | |
| 479 | Tees (Male or Female) 25*3/4*25 mm | 1 | |
| 480 | Intermediate Union 20*20 mm | 1 | |
| 481 | Intermediate Union 25*25 mm | 1 | |
| 482 | Intermediate Union 32*32 mm | 1 | |
| 483 | Equal Tee 20*20*20 mm | 1 | |
| 484 | Equal Tee 25*25*25* mm | 1 | |
| 485 | Equal Tee 32*32*32 mm | 1 | |
| 486 | Reduced Union 25*20mm | 1 | |
| 487 | Reduced Union 32*20mm | 1 | |
| 488 | Reduced Union 32*25mm | 1 | |
| 489 | Reduced Union 50*32mm | 1 | |
| 490 | Reduced Elbow 25*20mm | 1 | |

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|-----|---|---|--|
| 491 | Reduced Elbow 32*25mm | 1 | |
| 492 | Reduced Elbow 40*32mm | 1 | |
| 493 | Reduced Elbow 50*40mm | 1 | |
| 494 | Male Adaptor with metal threaded 20*1/2 | 1 | |
| 495 | Male Adaptor with metal threaded 25*3/4 | 1 | |
| 496 | Male adaptor with metal threaded 40*1 1/4 | 1 | |
| 497 | Male adaptor with metal threaded 50*1 1/2 | 1 | |
| 498 | Male adaptor with metal threaded 75*2 1/2 | 1 | |
| 499 | Equal elbow 20*20 | 1 | |
| 500 | Equal elbow 25*25 | 1 | |
| 501 | Equal elbow 32*32 | 1 | |
| 502 | Equal elbow 40*40 | 1 | |
| 503 | Equal elbow 50*50 | 1 | |
| 504 | Equal elbow 63*63 | 1 | |
| 505 | Equal elbow 75*75 | 1 | |
| 506 | Equal elbow 90*90 | 1 | |
| 507 | Equal elbow 110*110 | 1 | |
| 508 | End cap male 3/4x1/2 female | 1 | |
| 509 | End cap male 1 1/2x1 1/4 female | 1 | |
| 510 | Reduced tee 25*20*25 mm | 1 | |
| 511 | Reduced tee 32*20*32 mm | 1 | |
| 512 | Reduced tee 32*25*32 mm | 1 | |
| 513 | Reduced tee 40*20*40 mm | 1 | |
| 514 | Reduced tee 40*25*40 mm | 1 | |
| 515 | Reduced tee 40*32*40 mm | 1 | |
| 516 | PP compression equal valve 20*20 | 1 | |
| 517 | PP compression equal valve 25*25 | 1 | |
| 518 | PP compression equal valve 32*32 | 1 | |
| 519 | PP compression equal valve 40*40 | 1 | |
| 520 | PP compression equal valve 50*50 | 1 | |
| 521 | PP compression equal valve 63*63 | 1 | |
| 522 | PP compression connecting valve with metal ball 1/2*1/2 | 1 | |
| 523 | PP compression connecting valve with metal ball 3/4*3/4 | 1 | |
| 524 | PP compression connecting valve with metal ball 1*1 | 1 | |
| 525 | PP compression connecting valve with metal ball 1 1/4*1 1/4 | 1 | |
| 526 | PP compression connecting valve with metal ball 1 1/2*1 1/2 | 1 | |
| 527 | PP compression female valve 20*1/2 | 1 | |
| 528 | PP compression female valve 25*3/4 | 1 | |

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|-----|---|---|--|
| 529 | PP compression female valve 40*1 1/4 | 1 | |
| 530 | PP compression female valve 50*1 1/2 | 1 | |
| 531 | Mini ball valve Ø16x16 | 1 | |
| 532 | Mini ball valve Ø20x20 | 1 | |
| 533 | Mini ball valve Ø20x16 | 1 | |
| 534 | Mini ball valve Ø25x25 | 1 | |
| 535 | Adjustable dripper Flow rate 2Lt/h | 1 | |
| 536 | Adjustable dripper Flow rate 4Lt/h | 1 | |
| 537 | Adjustable dripper Flow rate 8Lt/h | 1 | |
| 538 | Adjustable dripper Flow rate 12Lt/h | 1 | |
| 539 | Rotating sprayer Flow rate 80Lt/h | 1 | |
| 540 | Rotating sprayer Flow rate 120Lt/h | 1 | |
| 541 | Punch drilling apparatus 3mm | 1 | |
| 542 | Punch drilling apparatus 4mm | 1 | |
| 543 | Mini sprink for green house Flow rate 40Lt/h | 1 | |
| 544 | Mini sprink for green house Flow rate 80Lt/h | 1 | |
| 545 | Mini sprink for green house Flow rate 120Lt/h | 1 | |
| 546 | Supply Ø90 mm / Ø75 mm Cross TE | 1 | |
| 547 | Supply Ø90 mm / Ø90 mm Cross TE | 1 | |
| 548 | Supply Ø90 mm / Ø75 mm TE | 1 | |
| 549 | Supply Ø90 mm / Ø90 mm TE | 1 | |
| 550 | Supply 2,5" - Ø 75mm Elbow | 1 | |
| 551 | Supply 3" - Ø90 mm Elbow | 1 | |
| 552 | Supply Ø90 / Ø75 mm Reduction | 1 | |
| 553 | Supply Ø110 / Ø75 mm Reduction | 1 | |
| 554 | Supply 2,5" - Ø75 mm Male End CAP | 1 | |
| 555 | Supply 3" - Ø90 mm Male End CAP | 1 | |
| 556 | Supply 2,5" - Ø75 mm Line Valve | 1 | |
| 557 | Supply 3" - Ø90 mm Line Valve | 1 | |
| 558 | Supply 2, 5" - 75 mm - Abot 1" Outlet | 1 | |
| 559 | Supply 3" - 90 mm - Abot 1" Outlet | 1 | |
| 560 | Supply Ø75 mm Gasket | 1 | |
| 561 | Supply Ø90 mm Gasket | 1 | |
| 562 | Supply Ø110 mm Gasket | 1 | |
| 563 | Tripod with adjustable legs, Water input2", Wateroutput;2", Pipe Height 2m, Max working pressure 4 kg/cm2 (70 psi) | 1 | |
| 564 | Weight: 19 kg | 1 | |
| 565 | Supply tank outlet coupling, 1" | 1 | |
| 566 | Supply tank outlet coupling, 1.5" | 1 | |
| 567 | Supply tank outlet coupling, 3" | 1 | |

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| 568 | Steel reel with following features (Steel frame, 2-inch wheels and the axle, the handle, the base where the reel will be based and joined, Basket flange, basket hub and the crank handle, Water system which will be joined on the ball valve at the plot outlet. | 1 | |
| 569 | Rain gun (1.25 inch) | 1 | |
| 570 | Rain gun (1.5 inch) | 1 | |
| 571 | Brass Nozzel Sprinkler (3/4 inch) | 1 | |
| 572 | Big Rain gun (Galvanized with 2 inch inlet and discharge of 20m ³ /hr at radius of 40m) | 1 | |
| 573 | Sprinkler rain jet 40 with Standard Nozzles: 10mm – 12mm – 14mm -16mm – 18mm – 20mm – 22mm Body Angle: 25o Inlet size: 2” Female | 1 | |
| 574 | Reinforced Hose Pipe DN 32, mm | 1 | |
| 575 | Reinforced Hose Pipe DN 25, mm | 1 | |
| 576 | Plastic Nozzel Sprinkler (Mini Sprinkler) (3/4 inch) | 1 | |
| 577 | Plastic Nozzel Sprinkler (Micro Sprinkler) (3/4 inch) | 1 | |
| 578 | GI Reducer (2.5 inch*1.25 inch) | 1 | |
| 579 | GI Reducer (2.5 inch*2 inch) | 1 | |
| 580 | GI Reducer (2 inch*1.5 inch) | 1 | |
| 581 | Air Release valve (3/4 inch) | 1 | |
| 582 | Air Release valve (1/2 inch) | 1 | |
| 583 | Air Release valve (1 inch) | 1 | |
| 584 | Air Release valve (1.5 inch) | 1 | |
| 585 | Air Release valve (2 inch) | 1 | |
| 586 | Sand filter with back wash assembly (2 inch) complete kit | 1 | |
| 587 | Sand filter with back wash assembly (2.5 inch) complete kit | 1 | |
| 588 | Sand filter with back wash assembly (3 inch) complete kit | 1 | |
| 589 | Hydrocyclone filter (2 inch) | 1 | |
| 590 | Hydrocyclone filter (2.5 inch) | 1 | |
| 591 | Hydrocyclone filter (3 inch) | 1 | |
| 592 | Disc Filter (Plastic) (2 inch) | 1 | |
| 593 | Disc Filter (Plastic) (2.5 inch) | 1 | |
| 594 | Disc Filter (Plastic) (3 inch) | 1 | |
| 595 | Screen Filter (Plastic) (1.5 inch) | 1 | |
| 596 | Screen Filter (Plastic) (2 inch) | 1 | |
| 597 | Screen Filter (Plastic) (2.5 inch) | 1 | |
| 598 | Screen Filter (Plastic) (3 inch) | 1 | |
| 599 | Venturi with assembly (3/4 inch) | 1 | |
| 600 | Venturi with assembly (1 inch) | 1 | |
| 601 | Venturi with assembly (2 inch) | 1 | |

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| 602 | Header Assembly/Manifold (Metal) (2 inch) | 1 | |
| 603 | Header Assembly/Manifold (Metal) (2.5 inch) | 1 | |
| 604 | Header Assembly/Manifold (Metal) (3 inch) | 1 | |
| 605 | Header Assembly/Manifold (Plastic) (2 inch) | 1 | |
| 606 | Header Assembly/Manifold (Plastic) (2.5 inch) | 1 | |
| 607 | Header Assembly/Manifold (Plastic) (3 inch) | 1 | |
| 608 | Butterfly valve (Metal) (1.5 inch) | 1 | |
| 609 | Butterfly valve (Metal) (2 inch) | 1 | |
| 610 | Butterfly valve (Metal) (2.5 inch) | 1 | |
| 611 | Butterfly valve (Metal) (3 inch) | 1 | |
| 612 | Pressure gauge cock (1/4 inch) | 1 | |
| 613 | Ball Valve (Plain Type) (1.5 inch) | 1 | |
| 614 | Ball Valve (Plain Type) (2 inch) | 1 | |
| 615 | Ball Valve (Plain Type) (2.5 inch) | 1 | |
| 616 | Ball Valve (Plain Type) (3 inch) | 1 | |
| 617 | Ball Valve (Threaded Type) (1.5 inch) | 1 | |
| 618 | Ball Valve (Threaded Type) (2 inch) | 1 | |
| 619 | Ball Valve (Threaded Type) (2.5 inch) | 1 | |
| 620 | Ball Valve (Threaded Type) (3 inch) | 1 | |
| 621 | Ball Valve (Flanged Type) (1.5 inch) | 1 | |
| 622 | Ball Valve (Flanged Type) (2 inch) | 1 | |
| 623 | Ball Valve (Flanged Type) (2.5 inch) | 1 | |
| 624 | Ball Valve (Flanged Type) (3 inch) | 1 | |
| 625 | Service Saddle Clamps, PN16 (63 mm*1 inch) | 1 | |
| 626 | Service Saddle Clamps, PN16 (75 mm*1 inch) | 1 | |
| 627 | Service Saddle Clamps, PN16 (90 mm*1 inch) | 1 | |
| 628 | Service Saddle Clamps, PN16 (110 mm*1 inch) | 1 | |
| 629 | Adaptors (Male or Female) (20*1/2 inch) | 1 | |
| 630 | Adaptors (Male or Female) (20*3/4 inch) | 1 | |
| 631 | Adaptors (Male or Female) (25*1/2 inch) | 1 | |
| 632 | Adaptors (Male or Female) (25*3/4 inch) | 1 | |
| 633 | Adaptors (Male or Female) (25*1 inch) | 1 | |
| 634 | Adaptors (Male or Female) (32*1/2 inch) | 1 | |
| 635 | Tees (Male or Female) (20*1/2 inch*20 mm) | 1 | |
| 636 | Tees (Male or Female) (20*3/4 inch*20 mm) | 1 | |
| 637 | Tees (Male or Female) (25*1/2 inch*25 mm) | 1 | |
| 638 | Tees (Male or Female) (25*1 inch*25 mm) | 1 | |
| 639 | Tees (Male or Female) (25*1/4 inch*25 mm) | 1 | |
| 640 | Tees (Male or Female) (32*1/2 inch*32 mm) | 1 | |
| 641 | Tees (Male or Female) (32*3/4 inch*32 mm) | 1 | |
| 642 | Tees (Male or Female) (32*1 inch*32 mm) | 1 | |

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| 643 | Male adaptor with metal threaded (32*1 inch) | 1 | |
| 644 | Male adaptor with metal threaded (63*2 inch) | 1 | |
| 645 | Male adaptor with metal threaded (90*3 inch) | 1 | |
| 646 | Male adaptor with metal threaded (110*4 inch) | 1 | |
| 647 | End Cap (male 1 inch*3/4-inch female) | 1 | |
| 648 | End Cap (male 1 1/4 inch*1-inch female) | 1 | |
| 649 | End Cap (male 2 inch*1 1/2 female) | 1 | |
| 650 | Elbows (male or female) (20*1/2 inch) | 1 | |
| 651 | Elbows (male or female) (20*3/4 inch) | 1 | |
| 652 | Elbows (male or female) (25*1/2 inch) | 1 | |
| 653 | Elbows (male or female) (25*3/4 inch) | 1 | |
| 654 | Elbows (male or female) (25*1 inch) | 1 | |
| 655 | Elbows (male or female) (32*3/4 inch) | 1 | |
| 656 | Elbows (male or female) (32*1 inch) | 1 | |
| 657 | Elbows (male or female) (32*1 1/4 inch) | 1 | |
| 658 | Elbows (male or female) (40*1 inch) | 1 | |
| 659 | Elbows (male or female) (40*1 1/4 inch) | 1 | |
| 660 | Elbows (male or female) (40*1 1/2 inch) | 1 | |
| 661 | Elbows (male or female) (50*1 1/4 inch) | 1 | |
| 662 | Elbows (male or female) (50*1 1/2 inch) | 1 | |
| 663 | Elbows (male or female) (50*2 inch) | 1 | |
| 664 | Elbows (male or female) (63*1 1/2 inch) | 1 | |
| 665 | Elbows (male or female) (63*2 inch) | 1 | |
| 666 | PP compression connecting valve with metal ball (2 inch*2 inch) | 1 | |
| 667 | PP compression female valve (32*1 inch) | 1 | |
| 668 | PP compression female valve (63*2 inch) | 1 | |
| 669 | Hose addition (1/2 inch*1/2 inch) | 1 | |
| 670 | Hose addition (3/4 inch*3/4 inch) | 1 | |
| 671 | Hose addition (1 inch*1 inch) | 1 | |
| 672 | Hose addition (1 1/4 inch*1 1/4 inch) | 1 | |
| 673 | Hose addition (1 1/2 inch*1 1/2 inch) | 1 | |
| 674 | Hose addition (2 inch*2 inch) | 1 | |
| 675 | Aluminum Female camlocks (1 inch) | 1 | |
| 676 | Aluminum Female camlocks (1-inch 1/2) | 1 | |
| 677 | Aluminum Female camlocks (2 inch) | 1 | |
| 678 | Aluminum Female camlocks (2-inch 1/2) | 1 | |
| 679 | Aluminum Male camlocks (1 inch) | 1 | |
| 680 | Aluminum Male camlocks (1-inch 1/2) | 1 | |
| 681 | Aluminum Male camlocks (2 inch) | 1 | |
| 682 | Aluminum Male camlocks (2-inch 1/2) | 1 | |

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| 683 | Aluminum Camlocks clamp (1 inch) | 1 | |
| 684 | Aluminum Camlocks clamp (1-inch ½) | 1 | |
| 685 | Aluminum Camlocks clamp (2 inch) | 1 | |
| 686 | Aluminum Camlocks clamp (2-inch ½) | 1 | |
| 687 | Pressure Regulator valve (made of plastic) (1 inch) | 1 | |
| 688 | Pressure Regulator valve (made of plastic) (1-inch ½) | 1 | |
| 689 | Pressure Regulator valve (made of plastic) (2 inch) | 1 | |
| 690 | Pressure Regulator valve (made of plastic) (2-inch ½) | 1 | |
| 691 | Pressure Gauge (Stainless Steel 304 Dual Scale Liquid Filled Pressure Gauge with Brass Internals, 0-60 psi/kpa,2-1/2-inch Dial Display, +/-1.5% Accuracy, ¼ inch NPT Bottom Mount) | 1 | |
| 692 | Pressure Gauge (Stainless Steel 304 Dual Scale Liquid Filled Pressure Gauge with Brass Internals, 0-60 psi/kpa, 1 inch 1/2 Dial Display, +/-1.5% Accuracy, ¼ inch NPT Bottom Mount) | 1 | |
| 693 | Pressure Gauge (Stainless Steel 304 Dual Scale Liquid Filled Pressure Gauge with Brass Internals, 0-60 psi/kpa,2-2-inch Dial Display, +/-1.5% Accuracy, ¼ inch NPT Bottom Mount) | 1 | |
| 694 | Pressure Gauge (Stainless Steel 304 Dual Scale Liquid Filled Pressure Gauge with Brass Internals, 0-60 psi/kpa,2-1/2 inch Dial Display, +/-1.5% Accuracy, ¼ inch NPT Bottom Mount) | 1 | |
| 695 | G.I elbow, 32mm | 1 | |
| 696 | G.I elbow, 40mm | 1 | |
| 697 | G.I elbow, 50mm | 1 | |
| 698 | G.I elbow, 63mm | 1 | |
| 699 | G.I elbow, 75mm | 1 | |
| 700 | G.I elbow, 90mm | 1 | |
| 701 | G.I union, 63mm | 1 | |
| 702 | G.I union, 32mm | 1 | |
| 703 | G.I union, 40mm | 1 | |
| 704 | G.I elbow, 32mm | 1 | |
| 705 | G.I union, 50mm | 1 | |
| 706 | G.I union, 63mm | 1 | |
| 707 | G.I union, 75mm | 1 | |
| 708 | G.I union, 90mm | 1 | |
| 709 | G.I Socket, 32mm | 1 | |
| 710 | G.I Socket, 40mm | 1 | |
| 711 | G.I socket, 50mm | 1 | |
| 712 | G.I Socket, 63mm | 1 | |
| 713 | G.I Socket, 75mm | 1 | |
| 714 | G.I socket,90mm | 1 | |
| 715 | G.I reducing bush, 50mmx40mm | 1 | |
| 716 | G.I reducing bush, 63mmx32mm | 1 | |

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| 717 | G.I reducing socket, 63mmx40mm | 1 | |
| 718 | G.I reducing socket, 63mmx53mm | 1 | |
| 719 | G.I reducing bush, 75mmx32mm | 1 | |
| 720 | G.I reducing bush, 75mmx40mm | 1 | |
| 721 | G.I reducing bush, 75mmx50mm | 1 | |
| 722 | G.I reducing bush, 75mmx63mm | 1 | |
| 723 | G.I reducer socket, 90mm x 50mm | 1 | |
| 724 | G.I reducer socket, 90mm x 63mm | 1 | |
| 725 | Diesel Engine, suction lift 7-8m, 2", TDH 65m, Q= 30 m3/h | 1 | |
| 726 | Solar panel: 1 watt | 1 | |
| 727 | Narrow teflon | 1 | |
| 728 | Pump wire,4*6 mm2, round | 1 | |
| 729 | Pump wire,2*1.5 mm2, round | 1 | |
| 730 | Pump wire,2*16 mm2, round | 1 | |
| 731 | HDPE adapter male threaded pn10 32mm | 1 | |
| 732 | HDPE adapter male threaded pn10 50mm | 1 | |
| 733 | HDPE adapter male threaded pn10 63mm | 1 | |
| 734 | HDPE adapter male threaded pn10 75mm | 1 | |
| 735 | HDPE adapter female threaded pn10 32mm | 1 | |
| 736 | HDPE adapter female threaded pn10 50mm | 1 | |
| 737 | HDPE adapter female threaded pn10 63mm | 1 | |
| 738 | HDPE adapter female threaded pn10 75mm | 1 | |
| 739 | Traveller irrigation machine mico TD 2000-300 twin; Effective irrigation Length: 300 Meter; Hose Length and Inside Diameter: 100+50 meter - 51mm; Effective Spray Width: 40 Meter – 65; Meter Cable Length, diameter: 300 Meter - 4 mm Rain gun Type: JET50; Flow Rate: 12m3/h - 30 m3/h; Recommended Working pressure: 10 bar-12 bar; Travel Speed: 7meter/hour - 50 meter/hour; Tractor Operated Hose Rewind System | 1 | |
| 740 | Traveller irrigation machine mico TD2500-200 ; Effective irrigation Lenght : 300 Meter; Hose Lenght And Inside Diameter: 100+50 meter - 51mm; Effective Spray Width: 40 Meter – 65; Meter Cable Lenght, diameter: 300 Meter - 4 mm Raingun; Type: JET50; Flow Rate: 12m3/h - 30 m3/h; Recommended Working pressure: 10 bar-12 bar; Travel Speed: 7meter/hour - 50 meter/hour; Tractor Operated Hose Rewind System | 1 | |
| 741 | Traveller irrigation machine eco TD3000-400; Effective irrigation Length: 400 Meter; Hose Length and Inside Diameter: 200meter - 76mm; Effective Spray Width: 60 Meter - 90 Meter; Cable Length, diameter: 400 Meter - 6 mm; Raingun Type: JET55 Flow Rate: 28m3/h - 66 m3/h; Recommended Working pressure: 10 bar-12 bar; Travel | 1 | |

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| | Speed: 12meter/hour - 70meter/hour; PTO Air Compressor Standard for Hose Clean | | |
| 742 | SmartPSUk2-40 AC/DC Converter to Supply PSk2 Pump Systems with Power from a Generator or Grid Supply | 1 | |
| | Total Unit Price | | |

N.B.:

Items to be supplied should be brand new and genuine.