## SW-120+（150+65） PVC/XLPE Sheathing Line

### 1. General description

This machine is used for PVC, PE, XLPE and LSZH for power cable inner and outer sheathing extrusion.

### 2. Main technical parameter:

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| **2.1** | **Product range** | |
| | Input conductor/cable size | Φ20.0～Φ130.0mm |
| | Diameter over insulation/sheath | Φ30.0～Φ140.0mm |
| **2.2** | **Extrusion materials** | |
| | Filling/sheath | PVC, PE, XLPE, LSZH |
| **2.3** | **Line speed** | |
| | Production speed | Max.60 m/min(based on the cable diameter) |
| **2.4** | **Stability of power supply:** | |
| | Voltage: 380 V | +/-10% |
| | Frequency: 50 Hz | +/-1% |
| | Minimal water pressure requirement | 4 bar |
| | Cooling water flow rate | Appr.500 l/min |
| | Minimal air pressure requirement | 6 bar |
| | Air flow | Appr. 500 l/min |
| **2.5** | **Insulation/sheath material** | |
| | PVC | Standard PVC |
| | XLPE/PE/LSZH | |
| **2.6** | **Extruder output** | |
| | 120-25D | 600kg/h±5% (without crosshead, soft PVC)<br>400kg/h ±5% (LSZH) |
| | 150 -25D | 1300kg/h±5% (without crosshead, soft PVC)<br>1300kg/h ±5% (LSZH) |

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|---|---|---|
| | 65 -25D | 150kg/h±5% (without crosshead, soft PVC)<br>130kg/h ±5% (LSZH) |
| **2.7** | **Pay-off spool** | |
| | Spool flange diameter | 1600 -3150 mm |
| | Spool width | Max. 2300 mm |
| | Max. Spool weight | 18000 kg |
| **2.8** | **Take-up spool** | |
| | Spool flange diameter | 1600 -3150 mm |
| | Spool width | Max. 2300 mm |
| | Max. Spool weight | 18000 kg |
| **2.9** | **Color of equipment** | |
| | Machines | Blue RAL 5015 |
| | Electrical cabinets | Grey RAL 7032 |
| | Moving and rotating parts | Orange RAL 2004 |

**3. Main components**

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|---|---|---|---|
| 3.1 | Φ3150 portal type pay off | Mechanical tension<br>PN1600～PN3150 | 1 set |
| 3.2 | Pay off centering dancer | | 1 set |
| 3.3 | 2500kg front belt pneumatic caterpillar | 2500kg | 1 set |
| 3.4 | Main Extruder 120 | 120-25D | 1 set |
| 3.5 | Main extruder 150+65 | 150-25D,65-25D | 1 set |
| 3.6 | Material hopper and loader for 120 extruder | Automatically | 1 set |
| 3.7 | Material hopper and loader for 150 extruder | Automatically | 1 set |
| 3.8 | Material hopper and loader for 65 extruder | Automatically | 1 set |
| 3.9 | Crosshead for 150+65 extruder | input: Φ20mm-Φ130mm<br>output: Φ30mm-Φ140mm | 1 set |
| 3.10 | Crosshead for 120 extruder | input: Φ8mm-Φ80mm | 1 set |

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|---|---|---|---|
| | | output: Φ10mm-Φ90mm | |
| 3.11 | Vacuum system | | 2 sets |
| 3.12 | Stainless steel trough with 4m movable water tank | 4+26 meters<br>Section:<br>400mmX380mmX2.5mm | 1 set |
| 3.13 | Spark tester | 25KV | 1 set |
| 3.14 | Length meter counter | | 1 set |
| 3.15 | 2500kg back belt pneumatic caterpillar | 2500kg | 1 set |
| 3.16 | Take-up Dancer | | 1 set |
| 3.17 | Φ3150 portal type take-up | PN1600～PN3200 | 1 set |
| 3.18 | PLC Electric control system | | 1 set |
| 3.19 | 120 screw for PVC and PE | | 1 set |
| 3.20 | 120 screw for LSZH | | 1 set |
| 3.21 | 150 screw for PVC and PE | | 1 set |
| 3.22 | 150 screw for LSZH | | 1 set |
| 3.23 | 65 screw for PVC and PE | | 1 set |
| 3.23 | Extrusion dies for Commissioning | The customer need provide the cable size and dies list | 1 set |
| 3.24 | Spare parts for 1 year | | 1 set |

**4. Specification for the main components**

**4.1. Φ3150mm portal type pay off (motorized)**

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|---|---|---|
| 4.1.1 | Pay off type | portal type (beam on the ground) |
| 4.1.2 | Bobbin size | Φ1600-3150mm |
| 4.1.3 | Bobbin width | 1180～2300mm |
| 4.1.4 | Spindle size | Φ80 ,Φ125mm and Φ160mm |
| 4.1.5 | Applicable cable Dia. | Φ20-Φ140mm |
| 4.1.6 | Tension | Mechanical tension and adjustable |

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|---|---|---|
| 4.1.7 | Max. loading | 18 tons |
| 4.1.8 | Clamping motor | 1.5 KW AC Motor + reducer driving |
| 4.1.9 | Loading/Unloading | 3.0KW AC Motor + reducer driving |
| 4.1.10 | Moving motor | 2.2KW AC Motor + reducer driving |
| 4.1.11 | Pay-off tension is controlled by mechanical friction and adjusted. | |
| 4.1.12 | Portal self-traverse type Payoff is made of steel construction and has strong body. | |
| 4.1.13 | Pintle open-close motion is made by AC motor. | |
| 4.1.14 | Towers will be able to move both side separately or together. | |
| 4.1.15 | Main electrical panel and suspended control panel are on the machine. | |
| 4.1.16 | Motor of pay off: 11KW AC motor & ETD controller. | |
| 4.1.17 | Main bearing: NSK brand, others: HRB, LYC, ZWZ. | |
| 4.1.18 | The payoff device uses portal type and ground rail moving, upper of device is sleeve type, the body is bent and welded to the frame. Two pintle thimbles of the both side are driven by two motor through cyclical reducer to screw nut, and can move together or alone, with mechanical and electrical dual protection, operator can change the pintle for different section reel when necessary. | |

**4.2. Pay off centering dancer**

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| 4.2.1 | structure | Independent vertical and horizontal guide roller, the spring mechanism and |

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| | | proximity switch, system. |
| 4.2.2 | Function | Through the proximity switch to control the self-running function of the pay-off frame to maintain the angle of the cable core, so that the cable core to maintain a basic position in the state. |

**4.3 2500KG front belt pneumatic caterpillar (2 sets)**

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|---|---|---|
| 4.3.1 | Max Force | 2500kg |
| 4.3.2 | Max speed | 60m/min |
| 4.3.3 | Cable size | Φ20～Φ140mm |
| 4.3.4 | Qty of cylinders | 8 pairs |
| 4.3.5 | Working length | 2400mm |
| 4.3.6 | Width of caterpillar belt | 150mm |
| 4.3.7 | Driving motor | 15KW AC motor |
| 4.3.8 | Motor control | ETD brand |
| 4.3.9 | Transmission | Motor with gearbox reducer |
| 4.3.10 | Total pressure | 0.8 MPa, working pressure: 0.3-0.7MPa |
| 4.3.11 | Top bottom flat belt haul off, compression and tensioning by air actuation. | |
| 4.3.12 | Entrance and exit equips with wire guide rollers. | |
| 4.3.13 | Main electrical panel and suspended control panel are on the machine | |

**4.4. 120 main extruder**

| | | |
|---|---|---|
| 4.4.1 | Length-diameter Ratio: | 25:1 |
| 4.4.2 | Screw type | New BM type, suitable for PE and PVC |
| 4.4.3 | Screw material | 38CrMoALA with nitriding treatment |

| | | |
|---|---|---|
| 4.4.4 | Barrel material | 38CrMoALA with nitriding treatment |
| 4.4.5 | screw rigidity | reach to HV950 |
| 4.4.6 | Barrel rigidity | reach to HV950 |
| 4.4.7 | Main bearing | China famous brand |
| 4.4.8 | Main motor | Z4-160KW DC motor + ETD brand controller |
| 4.4.9 | Screw rotate speed | 0-100rpm |
| **4.4.10** | **Extruder capability** | **PVC: 600kg/h±5%;**<br>**LSZH: 400kg/h±5%** |
| 4.4.11 | Barrel is equipped with pressure sensor and blasting switch. | |
| **Heating and cooling system** | | |
| 4.4.12 | 6 section heating and fan cooling system for extruder barrel | |
| 4.4.13 | Heating power:6KW/each | |
| 4.4.14 | Cooling fan power: 1.1KW | |
| 4.4.15 | Barrel Max heating temperature is 300 , precision is within±2 | |

| | | |
|---|---|---|
| **Gear box material :** | | |
| 4.4.16 | gearbox | nodular cast iron |
| 4.4.17 | gear | 20CrMnTi with nitriding treatment, |
| 4.4.18 | Gearbox has hard surface gear teeth, forced oil lubricating(280) | |
| **Loading system** | | |
| 4.4.19 | Dryer capability: | 200kg/h |
| 4.4.20 | Loading capability | 800kg/h |
| 4.4.21 | Material | stainless steel container |
| 4.4.22 | With alarm when no material. | |
| **Cross head (1 set)** | | |
| 4.4.23 | Input: Φ8～Φ80mm | |
| 4.4.24 | Output: Φ10～Φ90mm | |
| 4.4.27 | Installed with vacuum system; Fan: 1.5KW, 1500rpm | |
| |  | |

**4.5 150+65 main extruder**

| | | |
|---|---|---|
| 4.5.1 | Length-diameter Ratio: | 25:1 |
| 4.5.2 | Screw type | New BM type, suitable for PE and PVC |
| 4.5.3 | Screw material | 38CrMoALA with nitriding treatment |
| 4.5.4 | Barrel material | 38CrMoALA with nitriding treatment |
| 4.5.5 | screw rigidity | reach to HV950 |
| 4.5.6 | Barrel rigidity | reach to HV950 |
| 4.5.7 | Main bearing | China famous brand |

| | | |
|---|---|---|
| 4.5.8 | Main motor | Z4-250KW DC motor+ETD brand controller |
| 4.5.9 | Screw rotate speed | 0-82rpm |
| **4.5.10** | **Extruder capability** | **PVC: 1300kg/h±5%;**<br>**LSZH: 1300kg/h±5%** |
| 4.5.11 | Barrel is equipped with pressure sensor and blasting switch. | |
| **Heating and cooling system** | | |
| 4.5.12 | 7 section heating and fan cooling system for extruder barrel | |
| 4.5.13 | Heating power:15KW/each | |
| 4.5.14 | Cooling fan power: 1.1KW | |
| 4.5.15 | Barrel Max heating temperature is 300 , precision is within±2 | |

| | | |
|---|---|---|
| **Gear box material :** | | |
| 4.5.16 | gearbox | nodular cast iron |
| 4.5.17 | gear | 20CrMnTi with nitriding treatment, |
| 4.5.18 | Gearbox has hard surface gear teeth, forced oil lubricating(JHM420) | |

| | | |
|---|---|---|
| **Loading system** | | |
| 4.5.19 | Dryer capability: | 300kg/h |
| 4.5.20 | Loading capability | 1500kg/h |
| 4.5.21 | Material | stainless steel container |
| 4.5.22 | With alarm when no material. | |
| **Cross head (1 set)** | | |
| 4.5.23 | Input: Φ20～Φ130mm | |
| 4.5.24 | Output: Φ30～Φ140mm | |
| 4.5.27 | Installed with vacuum system; Fan: 2.2KW, 1500rpm | |
| 4.5.28 | Single layer single color (150 extruding) and single layer with strip(double color-150+65 extruding) | |
| |  | |
| **4.5.29** | **65 Extruder for strip** | |
| 1) | a. It shall be placed at the same side as the 150 extruder, with an angle of about 45 °.<br>b. The whole machine is movable and rotatable and can be lifted up and down. The lifting is driven by the motor, and the screw rod is self lifting, with a travel height of 100mm. Moving mode: linear bearing+linear slide rail, moving stroke 200mm. The rotation angle is 180 degrees.<br>c. Hardened gear reducer, gearbox gear is hardened and ground, gearbox gear is made of 20CrMnTi and carburized and quenched, transmission shaft is made of 40Cr and equipped with condenser; Keep the original factory nameplate of the gearbox.<br>d. Z4-30kW DC motor+speed measuring motor feedback, ETD brand series DC speed | |

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| | regulating device.<br>e. Omron digital temperature controller; Installed low smoke halogen-free special screw; The fuselage adopts cast aluminum heater, which is divided into four heating zones. The fuselage is air-cooled and the feeding section is water-cooled; The machine head is connected with the barrel by means of Huff; The machine head, neck, half, mold base, etc. are equipped with heaters to prevent failing to meet the plasticizing requirements in winter.<br>f. The temperature control accuracy is ± 2 , and the maximum heating temperature is 299<br>g. The material of screw barrel is 38CrMoAlA; Screw hardness is 900HV, barrel hardness is 1000HV, nitriding layer thickness is ≥ 0.5mm, nitriding time is ≥ 72h<br>h. Screw speed is 3~100rpm; The length diameter ratio is 25:1<br>i. Maximum extrusion amount: 130kg/h ± 5% (ordinary low smoke halogen-free material). 150kg/h±5%（PVC） |
| 2) | Screw: BM type |
| 3) | Dryer capability: 50kg/h; Loading capability:240kg/h |

**4.6. Cooling trough**

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|---|---|---|
| 4.6.1 | Material | stainless steel |
| 4.6.2 | structure | Hot water trough + cooling trough (400×380x2.5mm) |
| 4.6.3 | The hot water trough | 4m +0.5m³hot water heating tank |
| 4.6.4 | The cooling water trough | 26 meter |
| 4.6.5 | Total Length | 30 meter |
| 4.6.6 | Blower | Suitable for high speed |
| 4.6.7 | Water through With a support guide wheel, each tank before and after the need to add wheel | |

**4.7. Spark tester:**

| | | |
|---|---|---|
| 4.7.1 | Dia. range:: | Φ5~Φ140mm; |
| 4.7.2 | Voltage: | 0~25KV; |

**4.8. Meter counter**

| | | |
|---|---|---|
| 4.8.1 | Suitable cable Dia.: | Max.Φ140mm; |
| 4.8.2 | Length | 0~9999m |
| 4.8.3 | Accuracy | ≤±3‰ |
| 4.8.4 | |  |

**4.9 Φ3150mm portal take-up & traversing stand**

| | | |
|---|---|---|
| 4.9.1 | Bobbin size | Φ1600-3150 |
| 4.9.2 | Bobbin width | 1180～2300mm |
| 4.9.3 | Max. loading weight | 18T |
| 4.9.4 | Max. traversing dia. | 160mm |
| 4.9.5 | Max. take-up speed | 60m/min |
| 4.9.6 | Take-up driving motor | 15KW AC converter motor with gear box |
| 4.9.7 | Take-up driving motor control | ETD brand |
| 4.9.8 | Portal stand moving motor | 2.2KW AC Motor + reducer driving |

| | | |
|---|---|---|
| 4.9.9 | Bobbin loading/unloading | 3.0KW AC Motor + reducer driving |
| 4.9.10 | Bobbin clamping motor | 1.5KW AC Motor + reducer driving |
| 4.9.11 | Traverse motor | 3KW Servo motor-Mitsubishi brand |
| 4.9.12 | Traverse drive and control | ETD brand with SIEMENS smart 7'<br>Touch panel |
| 4.9.13 | Portal rail type structure, reel lifting, clamping or relaxing is by motor | |
| 4.9.14 | Pintle open-close motion is made by AC motor | |
| 4.9.15 | Main electrical panel and suspended control panel are on the machine | |
| 4.9.16 | Electrical components will be SIEMINS and Schneider | |
| 4.9.17 | Take-up motor is AC motor, controlled by ETD drive. Take-up tension is stable and adjustable. | |
| 4.9.18 | Take up moves for traversing, driven by AC motor, frequency inverter control, traversing speed follows take-up speed, traverse pitch is step-less. Portal take up has fast traversing function | |
| 4.9.19 | Take up has reel closing protection, reel loading and unloading limit protection, and side way movement limit protection | |

**5. The whole line control system advantage**

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| 5.1 | The whole production line is combined controlled by Siemens S7-1200 Serial PLC and SIEMENS colorful touch screen. |
| 5.2 | Main extruder 120 mm,150 mm and 65mm extruder and haul off caterpillar has synchronization and individual operation Function. |
| 4.1 | The main extruder output capacity nonlinear curve can be corrected. |
| 5.4 | Front and rear two caterpillars can be operated in synchronization or individually. |
| 4.3 | Other controls such as air wipe, water pump start. |
| 5.6 | Display with Temperature set data and actual data Parameters of extruder current, voltage and speed. |
| 4.4 | The process parameters, the operating parameters of the equipment and the working state of the display, set and control. |
| **5.8** | **Alarm** |
| 5.8.1 | Driving fault alarm |
| 5.8.2 | Temperature out of control alarm |
| 5.8.3 | Main extruder over pressure alarm |
| |  |

**6. Electrical control system**

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|---|---|
| 6.1 | The power of the machine: 3-phase and 5-wire standard, 380V (±10%), 50 HZ. |
| 6.2 | PLC+Touch Screen: SIEMENS |
| 6.3 | AC and DC driver system: ETD brand |

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|---|---|
| 6.4 | temperature controller: RKC Japan |
| 6.5 | AC motors: China famous brand |
| 6.6 | Main Low voltage component: Schneider brand and Chinese famous brand |
| 6.7 | With overload protection device. |
| 6.8 | Included the connect cable for whole line, but the cable to main cabinet should be provided by customer. |

**7. Other**

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|---|---|
| 7.1 | Operation direction of the machine: from right to lest. |
| 7.2 | The user supply bobbin drawing. |
| 7.3 | Main bearings from HRB, LYC, ZWZ Brand. |

**8. TOOLS for extruder machine**

| SN. | NAME | QTY. |
|---|---|---|
| **1** | 螺杆拆卸工具 Screw remover | 1SET |
| **2** | 机☒拆卸工具 Head removal tool | 1SET |
| **3** | 分流板 Splitter plate | 2PCS |
| **4** | 工具箱 Tool box | 1PCS |
| **5** | 活☒扳手 Adjustable wrench | 1PCS |
| **6** | 尖咀☒ Nose pliers | 1PCS |
| **7** | 内六角扳手 1-12　inner hexagon spanner | 1SET |
| **8** | 呆扳手 3-24　Wrench | 1SET |
| **9** | 螺☒刀(十字，一字)　bolt driver | 1SET |
| **10** | 月牙扳手 Crescent wrench | 1PCS |

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|---|---|---|
| **11** | 密封圈 seal ring | 1SET |
| **12** | 膨⊠螺⊠ Expansion screws | 1SET |

**9. SPARE PARTS**

| SN. | NAME | QTY. |
|---|---|---|
| **1** | 机⊠加⊠器 Head heater | 2 SETS |
| **2** | 机身加⊠器 Fuselage heater | 2 ZONE |
| **3** | ⊠⊠偶<br>Thermocouple | 2 PCS |
| **4** | 熔断器 Fuse | 2 PCS |
| **5** | 固⊠⊠⊠器 Solid state relay | 2 PCS |
| **6** | 模芯模套 Die and Nipple | 2 SETS |
| **7** | ⊠引机皮⊠ The belt of caterpillar | 2 PAIR |
| **8** | 哈夫机⊠架螺栓螺母<br>Head frame bolt and nut | 2 PCS |
| **9** | ⊠机皮⊠ Blet for motor | 2 SETS |
| **10** | 限位开关 Limit switch | 2 PCS |
| **11** | 航空插⊠插座 Aviation plug socket | 2 SETS |