schmidt maschinenbau gmbh

Drawing maschine type E10 with spooler S160

Technical datasheet

1 Technical Description

Drawing machine E10 S160:
Two cone pair single wire wet drawing machine
consisting of 2 pcs cone pairs (horizontal orientated);
Drawing dies supplied with drawing agent;
c/w integrated drawing agent system;
dancer controlled single wire spooler (cantilevered horizontal spooler shaft) ;
traversing pulley with automatic spool rim adjustment (without laser unit)

payoff :
adjustable bobbin holder (max. 20 kg)

Layout :
drawing ZA-ZU-087.0122-00

2. Produktionsparameter

Wire material	copper, copper alloys, precious metals
max. wire inlet diameter	0,095 mm
max. inlet wire tension	450 N/mm²
min. finished wire diameter	0,012 mm (0,0010 mm)
max. finished wire diameter	0,050 mm
max. finish wire tension	900 N/mm²
max. speed	15 m/s (spooler shaft max. 4.500 rpm)

Note: the machine is powered for wire inlet diameter 0,095 mm at 400 - 900 N/mm2. The actual achievable final diameter depends on various parameters which cannot be influenced by the machine (e.g. quality of dies, drawing media used, wire quality, spooling behaviour of the wire, spool quality) and must be found out empirically.

Note: The indicated drawing speed is a theoretical value; the actual achievable drawing speed depends on various parameters which cannot be influenced by the machine (e.g. quality of dies, drawing media used, wire quality, spooling behaviour of the wire, spool quality) and must be found out empirically.

3. Technical description drawing machine E10

cones CSR; WE

a) Machine gradations (correspond to the theoretical wire elongation or cross-sectional reduction without slippage); indications: 1st + 2nd cone pair

WE without s : 6 / 6 %
CSR without s : 5,6 / 5,6 %

b) Drawing-die gradations (correspond to a possible wire elongation or cross-sectional reduction with slippage); indications: 1st + 2nd cone pair

WE with s : 7 / 7 %
CSR with s : 6,54 / 6,54 %

Number of installed dies	20, of these: - 1 x 10 cone dies 6 % WE without slippage - 1 x 10 cone dies 6 % WE without slippage
Drawing cones	full ceramic, made from Zirconoxide
1st cone pair	6% elongation
Number of steps	10
Max. step-Ø	80 mm
Min. step-Ø	47,35 mm
2nd cone pair	6% elongation
Number of steps	10
Max. step-Ø	80 mm
Min. step-Ø	47,35 mm
Arrangement of cone pairs	horizontal

Note: The indicated drawing die gradations represent a possible value; the actual required or possible cross-sectional reduction must be determined by the user considering the necessary slippage. Please note that a too small slippage can result in wire breaks, a too high slippage can result in high wear of drawing cones and drawing die.

Spreader disc	Aluminium with chrome oxide coating
diameter	68 mm
holder	removeable
speed measurement	initiator

Drawing bay covered by 2 plexiglass hoods, hinged for vertical opening
Jog pedal along drawing bay

Drawing-agent supply system

integrated;
- tank made from stainless steel approx. ca. 50 litre content, moveable by roller
- drawing-agent circulation pump made from PVC
- hose couplings made from stainless steel
- 2 pcs cartridge filter 10” with stainless steel housing
- Level detection Min/Max
- Electric heater 400 W
- Leak tray 80 mm high kerb

drawing die holder

suitable for dies Ø 25 mm x min. 5 mm / max. 8 mm) ; made from stainless steel ; adjustable in two axis; dies flooded by drawing agent, supply and return pipe; all parts made from stainless steel

Option: traversing die holder, for equal wear out of step cones (no groove cutting); driven by stepping motor

4. Technical description spooler S 160

spool range

HK76/45, HKV100, HK100/59-160, HK130/82-176; AL4

limited speed in accordance to core diameter:
- HK76/45: 8 m/s
- HKV 100: 9 m/s
- HK100/59: 9 m/s
- HK130/82: 15 m/s

shaft Ø 15 mm; cantilevered

Spool fixing

screwed spool adapters

Spool take off

manual

Spooler drive

dancer controlled by frequency controlled drive; with brake (make by our choice)

Braking time

max. ca. 5 s during shut-off or wire breaks

Drive of spool shaft

via flat belts

Traverse unit	Wire traverse unit with automatic traversing width control (without optical measurement)
Option	optical spool measurement with laser barrier fork; this option is needed for wire below 25 µm;
	The traverse unit can be operated as common traverse unit with manual adjustment of the change-over points or with automatic traversing width control.
Operating mode “common traverse unit”	The basic adjustment of the traversing width is effected by selecting the spool type via the operating panel. Precision adjustment of the change-over points is effected via corrective values (+/- adjustment).
	Note: The optimum change-over time must be determined empirically by the customer by corrective input via the operating panel according to the operating parameters (wire speed, traversing speed, wire diameter, spool size etc.).
Operating mode “automatic traversing width control”	The basic adjustment of the traversing width is effected by selecting the spool type via the operating panel.
	The traversing width control is carried out with computer support according to a mathematical procedure evaluating various parameters. The optional optical spool measurement allows the traverse for perfect centring, to avoid any bad spooling at spool start already.
Traversing methode	traversing pulley
Traversing pattern	cylindrical winding of standard flange spools and bikonical spools
Drive of wire traverse unit	stepping motor, flat belt; speed/traversing step continuously adjustable
Traversing step	max. ca. 4 - 5 x d_{max}
	Note: 1xd traversing (layer-to-layer winding) is not possible.
	Note: The traversing step can be electronically coupled with the number of revolutions of the spool shaft, thus achieving a nearly constant traversing step from the spool core up to the spool flange; the coupling deviation is ± 10 %.
	Operation with constant traversing speed is possible (traversing step increases with increasing filling ratio)
dancer	dancer arm made from carbon, with notches for spring, incremental adjustable from 5 cN to 50 cN;
guiding pulleys	Ø 28 mm made from aluminium with ceramic layer
traversing pulley	Ø 28 mm made from aluminium with ceramic layer

machine frame	welded structure made of material St 37-2 or equivalent
Machine illumination	LED bulb above machine

5. Pay off

Manual pay off spool holder as per customer request; additional inlet wire felt holder

6. description of electrical control

Electric control	acc. to EN 60204-1 for environment min. 5 °C and max. 40 °C, height up to 1000 m SL ; max. humidity 90% at 20 °C and 50 % at 35 °C.
Protection	IP 44
voltage	3 x 400 V
frequency	50 Hz
control voltage	24 V DC
switchboard cooling	air circulation with fan and filter mat
power spooler drive:	1,1 kW
power drawing drive:	1,1 kW
control	Siemens S7-1200
modem	Netbiter; request for internet connection
machine data aquisition	as per Siemens documentation
electronic components	with VDE and UL certification
Touchpanel	Siemens TP700 Comfort 7" TFT colour
Frequency drive	make of our choice
Operating elements	- main switch - emergency-stop - wire break detection from dancer position - foot bar for jog operation
Control lamps	operation, error

7. others

painting	machine white RAL 9002; in wire area black
documentation	1 paper in French language, and pdf file
spare parts	per request
bearing lubrication	central oil circulation, oil tank 2 litre, gear pump and level supervision
leak tray	stainless steel leak tray underneath the drawing agent tank, pump and filter

8. Process materials and media

Drawing agent	conventional drawing emulsions, which will be procured by the customer; from the view of the machine manufacturer, the following requirements are to be defined to avoid injury to persons and damage to property: - max. viscosity 22 mm²/s (cSt) - max. admissible drawing-agent temperature 50 °C - sufficiently cleaned (= free from abrasions and wire residues which clog the drawing-agent circuit or damage the drawing-agent pump) Note: Drawing emulsions can considerably reduce the service lives of the shaft seals or the axial face seals (shorter maintenance intervals).
Compressed-air	compressed-air supply will be provided by the customer at site; Requirements of compressed-air mains: - min. mains pressure 6 bar - max. mains pressure 10 bar - compressed-air must be dry, free of dust and oil (select quality class of compressed air as per DIN ISO 8573-1 considering the pneumatic components acc. to the parts list corresponding to the operating conditions) to be installed by the customer at site: - lockable main cock - solenoid valve, if necessary - monitoring pressure gauge with operating pressure indication - any accessories required (e.g. compressed air storage in case of pressure fluctuations)
Pneumatic components	make Festo; pneumatically actuated ball valves make bar