Scientific

COMBI 26 mm Twin Screw Extruder type LTECC26-40

with Co and Counter-rotating twin screws for compounding of PVC and most other thermoplastic resins

Summary of standard features:

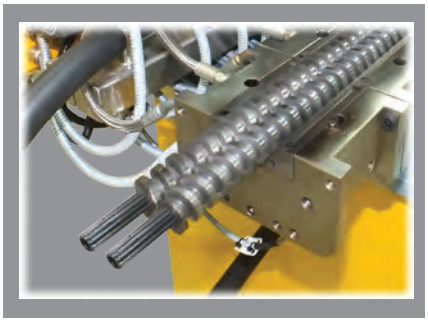
- Easy change over from co to counter rotating by means of a gear selector.
- Clam shell barrel type with wear inserts
- Available in 40 L/D
- Optionally the Combi Twin can be supplied with longer L/D where the barrel will be equipped with two infeed sections; one at 40 L/D for PVC processing and the other for longer L/D
- The Combi Twin can optional be equipped with side feeder.
- 15 kW drive with max 800 RPM for co-rotating and 400 RPM for counter rotating
- Max output pressure 300 bar and max screw torque of 2x90 Nm at 300 respectively 600 RPM
- Infeed barrel module with water cooling and all the remaining 9 and more modules are equipped with both electrical heating and water cooling
- Including vacuum vent with stainless steel vent housing and high suction vane pump. Also one additional atmospheric vent zone
- Optional side feeder to be used for the co rotating version with barrel inlet plug to be used for the Counter rotating PVC version

The Scientific 26 mm Combi co and counter-rotating twin screw extruder is made with a complete modular build up of the clam shell barrel, where each barrel section have a length of 4 D or 104 mm. The standard twin has a drive power of 15 KW and a max screw RPM of 400 for counter and 800 for Co-Rotating. It has a re-designed high torque gear box comprising of additional shaft supporting gears and a direct driven gear pump for closed loop forced oil lubrication and cooling.

A gear selector will switch the screw rotation from co to counter rotation.

The 26 mm twin screw version is equipped as standard with splined screw shafts. The new oil cooling system for our high torque gear box utilizes a block type of heat exchanger to ensure the gear box is kept cold at even the severest running conditions. This also ensures optimum lubrication to all gears and bearings

The screws are built up from individual single elements mounted on splined screw shafts.

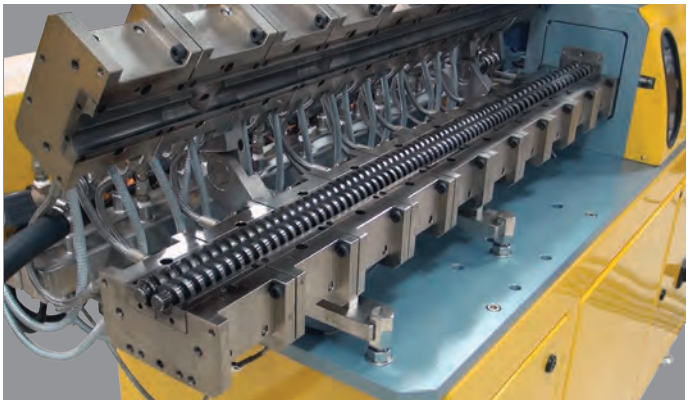


We have a large variety of screw as well as kneading elements which are available in several configurations.The standard screw components are made from high grade tool steel which is through hardened and nitrided but made with a slightly softer hardness than the barrel linings to ensure optimum life time for both elements and barrel inserts. Optionally the screw elements and barrel inserts can be made in hardened stainless steel for acid resistance or in very hard PPM steel for optimum wear resistance which may be needed when compounding ceramic materials.

Barrel module with hardened insert

Co-Rotating screw for most thermoplastic resins

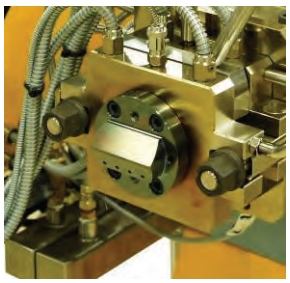
New Counter rotating PVC screw



Clam shell barrel for easy cleaning and for visualization of the melt process on the screws

The whole clam shell barrel assembly is split in the center and can be easily swung open after loosening the barrel bolts. This gives easy access to the screws for cleaning or changing of barrel inserts as well as to observe the melt and compounding characteristics of the polymer being processed. The top half of the barrel is balanced so that very little force is needed to open it up and with this the hazard of accidental heavy closing is eliminated

Each barrel zone is equipped with both water cooling and electric cartridge heating. This allows for complete process control at each zone of the barrel and the water cooling coupled with the high wattage heating enables fast temperature changes of each zone when changing processing conditions from one compound to another. The water cooling is done from channels inside each barrel module and regulated with individual solenoid valve from its designated temperature controller.



The extruders are supplied complete with a stainless steel volumetric hopper feeder with a single feed screw of spiral or solid screw types and with a stirring arm (agitator) above the feeding screw. The hopper feeder can optionally also be equipped with twin screws. The screw is driven by variable speed AC gear motor of 0.3 kW power and digital screw speed control mounted on the control cabinet. As shown to the right, the hopper feeder can easily be swung aside to enable emptying out of the batch inside the hopper

The extruder is also, as standard, equipped with a 4 holes strand die connected to extruder flange with 2 hinged bolts. The die is made with short distance to screws and minimum internal volume to enable very easy and fast cleaning. The die flange contains an easy removable breaker plate which can be exchanged with a distance ring, enabling production with or without screen packs

The strand die swings aside simply by loosening the two bolts to facilitate easy cleaning. For connection to other downstream equipment, such as flat die for a chill roll attachment, the extruder can optionally be supplied with a suitable die adaptor.

This 40 L/D and longer Twin is equipped with a vacuum zone on one of the barrel modules and also have an additional atmospheric vent opening which can be converted to vacuum. The vacuum vent zone has a stainless steel vent port housing which is equipped with a sight glass and vacuum regulator with gauge. The housing is connected to large twin vacuum filters and to a vane type vacuum pump mounted in the sub cabinet

Extruder Controls

Large clear vision control panel, mounted on a swing arm on the rear of the extruder and containing the following :

- One digital self tuning programmable temperature controller for each barrel module (10 units for the 40 L/D versions).
  Programmable pressure controller with digital indication of the screw tip pressure.
- Digital melt temperature indicators showing resin temperature at screw tip as well as at every second module. For the 32 L/D version there are then totally 4 melt temperature indicators and the 40 L/D versions have 5 of the same indicators.
- Digital RPM indicators for main screws speed as well as feeder screws speed with UP/DOWN scroll buttons to regulate speeds.
- Digital instrument showing screw torque in percent of max torque
- Clear warning lamps for:
  - Over pressure at screw tip (depending on your individually set max pressure)
  - Cooling water pressure too low
  - Clam shell open
  - Motor overload
  - Torque limiter overload
  - Feeder overload
  - Temperature not reached set value on any of the controllers due for instance broken heating element

Computerized Version

COMPUTERIZED PLC CONTROL WITH 10.4 INCH FULL COLOR LCD TOUCH SCREEN

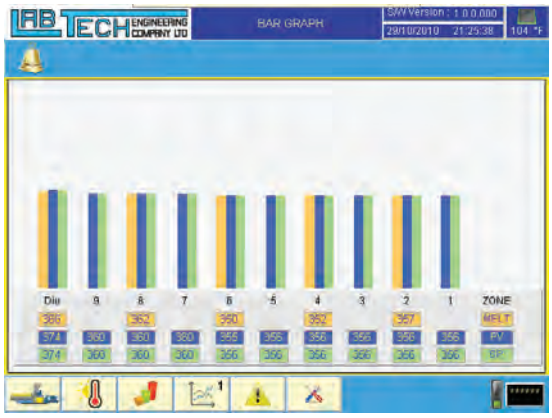
The computerized control has full visualization of all extruder parameters on the touch screen and is also offered with connection to an external PC where all formulation can be downloaded for data report. The high capacity PLC and software are supplied by B&R, Austria and the programs are custom made by Labtech. The controlling functions are as following:

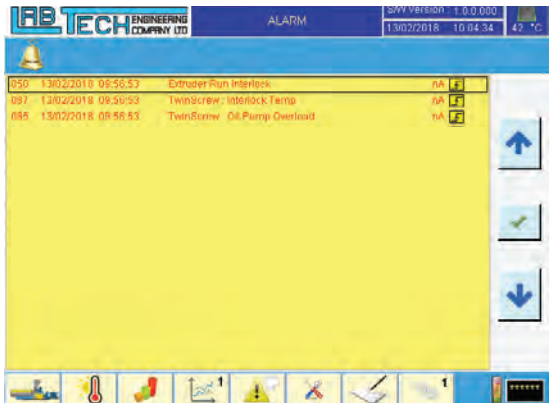
- Temperature up to 15 zones
- Motor speed with drive torque and RPM registration
- Pressure control of transducer at screw tip
- Speed control of hopper feeder/s as well as side feeder/s.
- Vacuum for barrel venting
- Pelletizer speed control, also control of optional variable speed strand feeding device

Alarm functions:

- Main motor overload
- Hopper feeder overload
- Trip torque
- Over pressure on die
- Pelletizer overload
- Strand feeding overload
- Low water pressure
- Low temp (on any zone) alarm if present temperature is lower than the set temperature. This low temperature alarm can be specified by operator.
- High temp (on any zone) alarm if temperature is higher than the set temperature. This high temp alarm can be specified by operators.

The PLC can also store up to 100 recipes with pre-selected running parameters of all extruder functions.





Optional SCADA software for processing data on your PC

The SCADA software has the ability to record all running parameter for a specific run can be saved and also directly downloaded to a PC. With this software it is also possible to save up to 100 formulations on a PC and upload these to the extruders touch screen. The software will enable you to have exactly the same screens on your PC as on the extruder and you can then key in with your PC new parameters directly on these screens.

Technical data for 26 mm Combi Co and Counter Rotating Twin screw extruder

Description	DATA		Description	DATA	
	Standard Co-Rotating	PVC Version Counter		Standard Co-Rotating	PVC Version Counter
Available L/D Ratio	40 and longer	40	Outer and inner screw diameter ratio (D/d)	1.63	1.63
Screw Speed (RPM)	0 to 800	0 to 300	Max barrel temp. (standard)	400 °C	400 °C
Motor Power (kW)	15 kW	15 kW	Heating power per barrel section (4 L/D)	2.0 kW	2.0 kW
Max. extrusion output pressure	250 bar	250 bar	Minimum water pressure and water consumption	1.5 bar / 20lt / min	1.5 bar / 20lt / min
Max. dynamic thrust bearing load	62 kN	62 kN	Water pump power for optional closed-looped cooling system	0.75 kW	0.75 kW
Maximum torque at 600 RPM	2x90Nm	2x90Nm	Minimum batch size (LDPE)	1,000 - 1,500 g	1,000 - 1,500 g
Specific Torque Nm/cm3	9.8	9.8	Net weight (for 40 L/D)	1,000 kg	1,000 kg

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