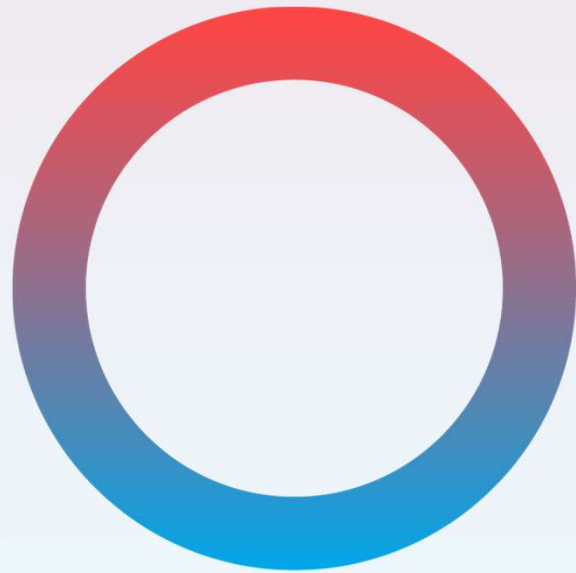


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THE NEW GENERATION:

INTEGRAL – TO THE CORE



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# PRODUCT PRESENTATION - INTEGRAL NEW GENERATION

E. Bossart, H. Ammon • 2019-11-19

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## CONTENT

1. Product features
2. Connectivity solutions
3. Timeline and availability
4. Accessories
5. Competitive environment
6. Summary



# 1. PRODUCT FEATURES

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# PRODUCT FEATURES

A similar look and feel – The whole Integral T / XT range in just 3 housings



A: 430 x 550 x 760 mm



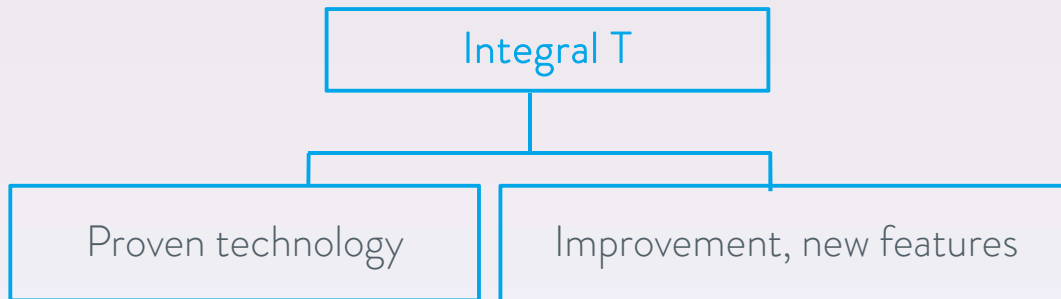
B: 665 x 550 x 1320 mm



C: 865 x 650 x 1600 mm

# PRODUCT FEATURES

Proven Integral technology enriched with many new features



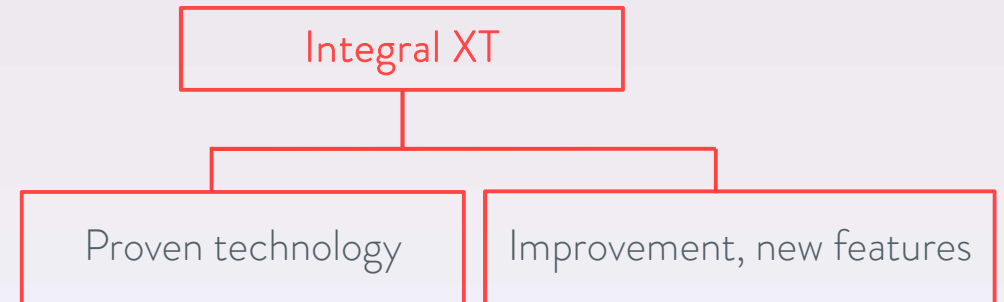
- Hydraulic system: compact bath
- Unregulated immersion pump
- Tower housing for more powerful devices
- Permanently mounted control unit with colored display
- Side mounted pump connections
- SmartCool cooling system
- Integrated web server and digital interfaces for maximum control





# PRODUCT FEATURES

Proven Integral technology enriched with many new features

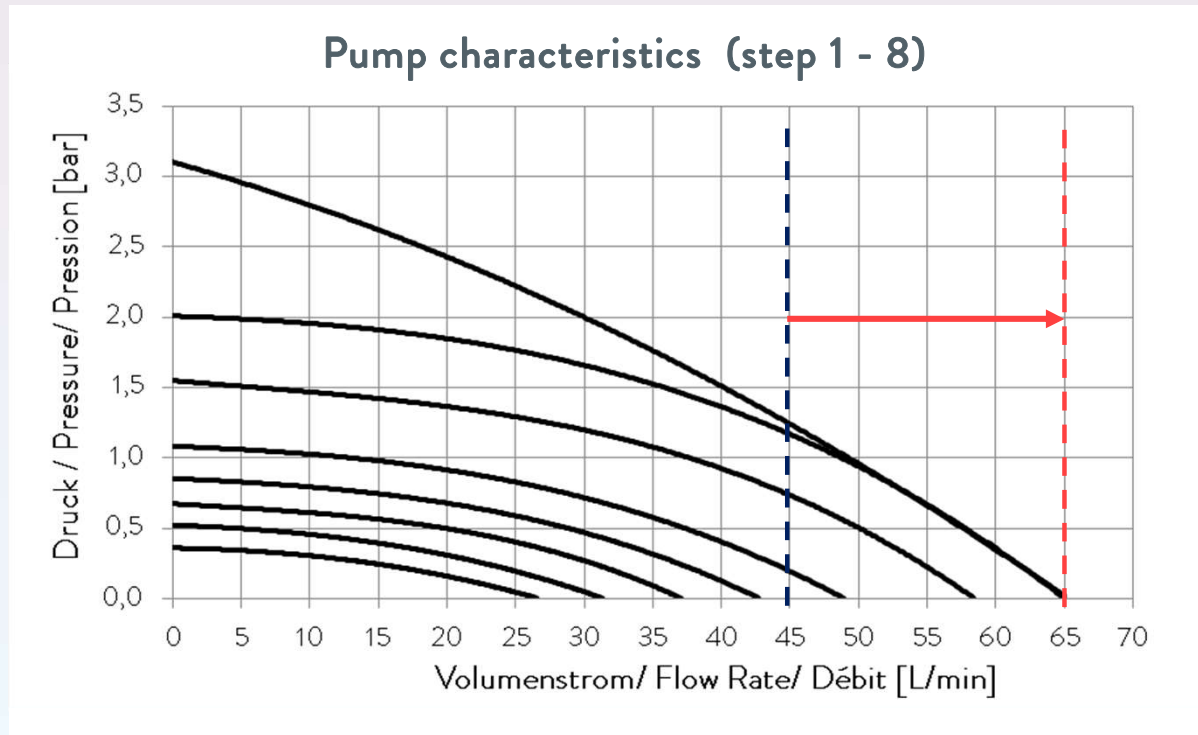


- Flow system
- Side mounted pump connections
- Digital interfaces

- Service friendly housing
- Permanently mounted operation unit with colored display
- Optimized hydraulic system (Filling volume, pressure drop, expansion volume)
- Significantly improved flow rates
- Integrated web server
- Flow control as accessory

# PUMP CHARACTERISTICS ALL INTEGRAL XT EXCEPT IN 1850 XTW

Flow rate improved by 44 %

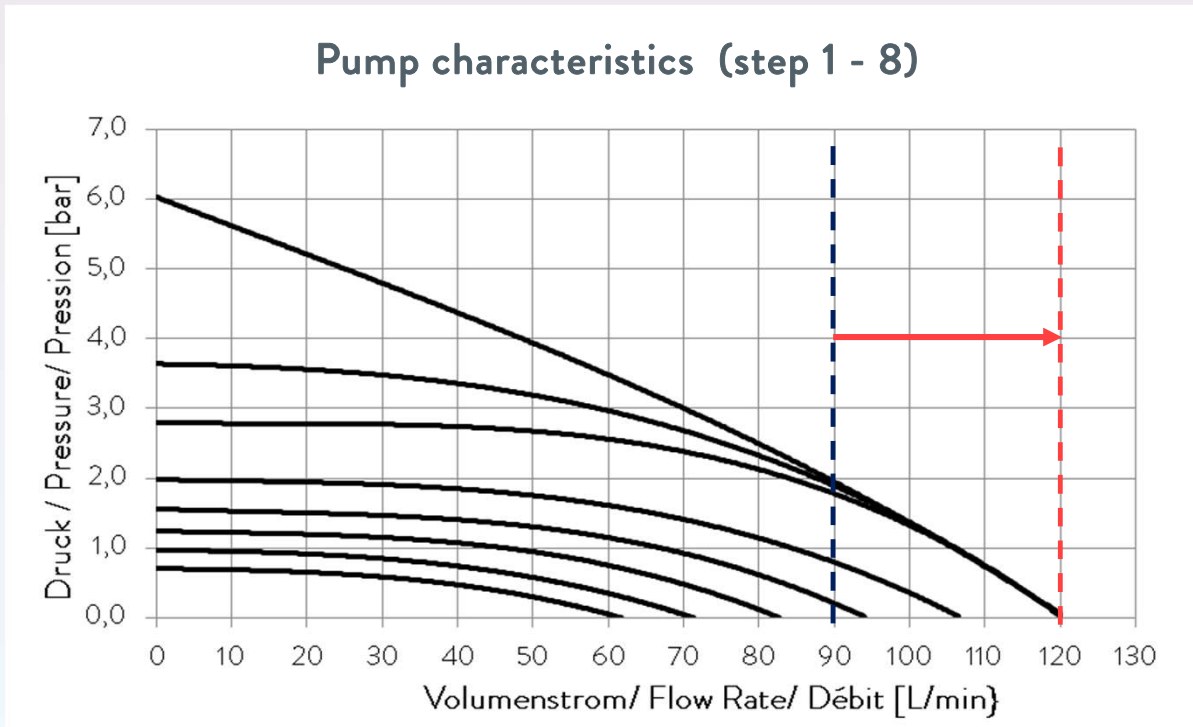


Optimized hydraulic system and speed control improve flow rate

- Advantage:
- High flowrate at low pressure, very useful in temperature control of glass reactors
  - Sufficient pressure in applications with a high pressure drop

# PUMP CHARACTERISTICS INTEGRAL IN 1850 XTW

Flow rate improved by 33 %

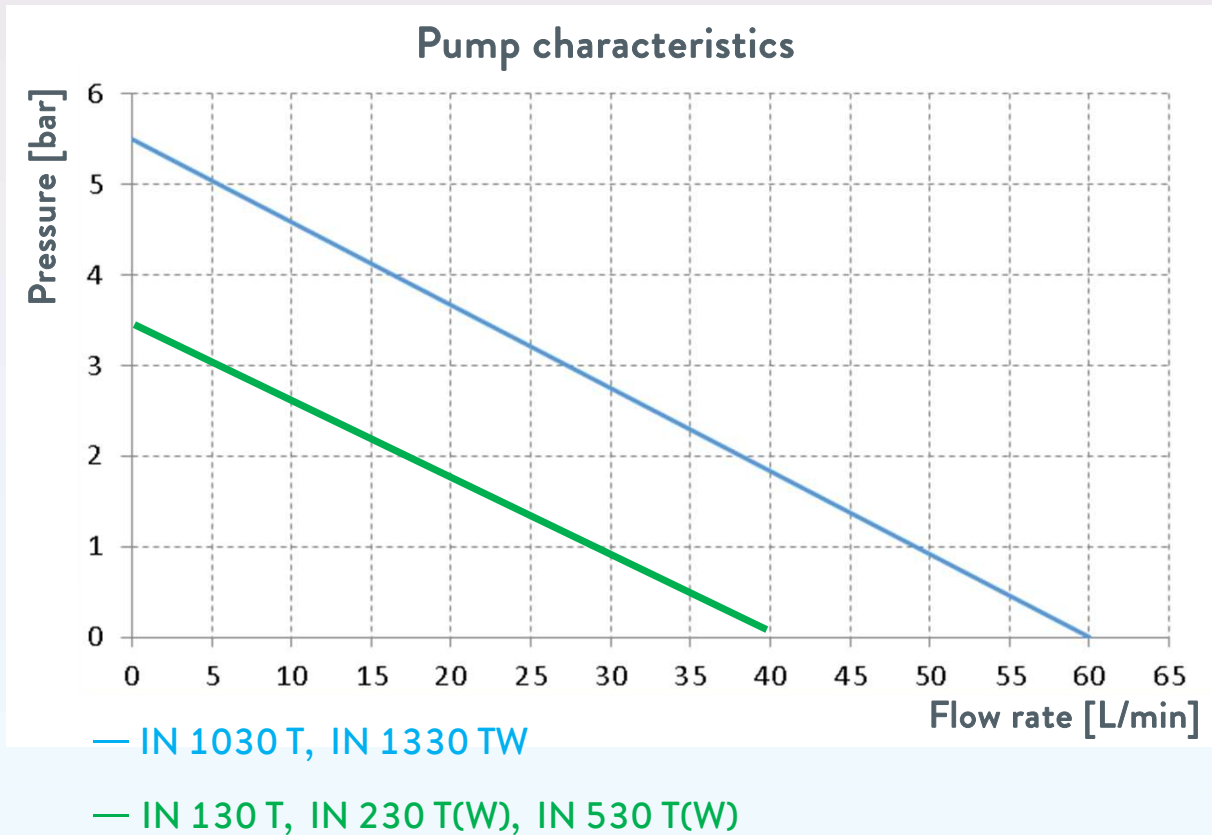


Optimized hydraulic system and speed control improve flow rate

Advantage: - High flowrate at low pressure, very useful in temperature control of glass reactors  
- Sufficient pressure in applications with a high pressure drop

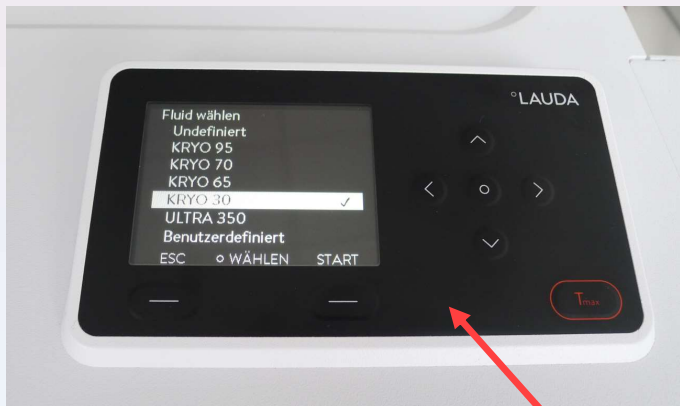
# PUMPS CHARACTERISTICS INTEGRAL T

Proven immersion pumps with powerful performance



# INTEGRAL OPERATING CONCEPT

Ergonomic position of control unit



Fix on top:  
Housing A



Fix on right side:  
Housing B and C

# INTEGRAL OPERATING CONCEPT

Command Touch as remote control - available as accessory



Remote control unit - Command Touch - can be placed on the right side of all units

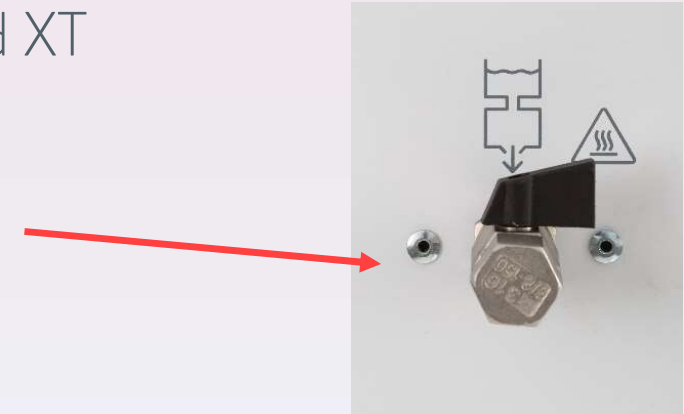
# INTEGRAL FILL AND DRAIN CONCEPT

Standardized mechanical interfaces for all Integral T and XT

Filler neck on top



Drain valve expansion tank (XT only)



Main drain valve units



Overflow opening on the back

Cooling water outlet and inlet



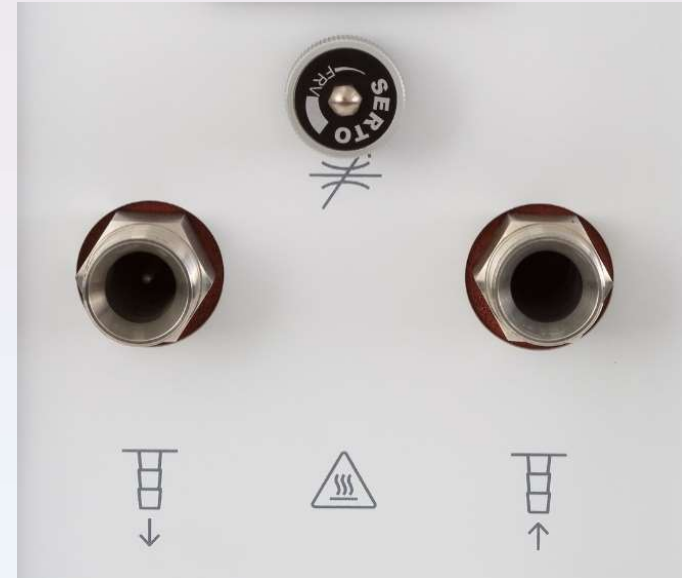
# INTEGRATED BYPASS

Precisely adjustable, now also for XT



Bypass Integral T

- Gate valve
- Use for pressure limitation with sensitive applications



Bypass Integral XT

- Precisely adjustable needle valve
- Use with low volume flows (< 10 L/min)



# SAFE OPERATION

Operational and digital security measures allow safe operation

## Digital security

- Webserver operation only for non-safety relevant parameters and visualization
- Secure communication by integrated certificate/key-infrastructure prevent manipulation and proper digital safety

## Operational safety

- Configurable safe-mode to define operation in case of malfunction, overtemperature, etc.
- Continuous monitoring of limit values (temperature, pressure, level) to warrant safe use
- Optical, acoustic and digital indication to signalize proper operation or malfunction

# SELF-ADAPTATION

Intuitive product setup by automated tools

## Setting up an Integral has never been as easy

- Intuitive self-adaptation allows the Integral to find best suited control parameters for the individual customer application
- Connect the Integral to the consumer (e.g. test specimen), fill and run the self-adaption
- If reactor, battery pack in a test chamber or temperature cycles simulating operation in space – the Integral will optimize its performance according to the application setup





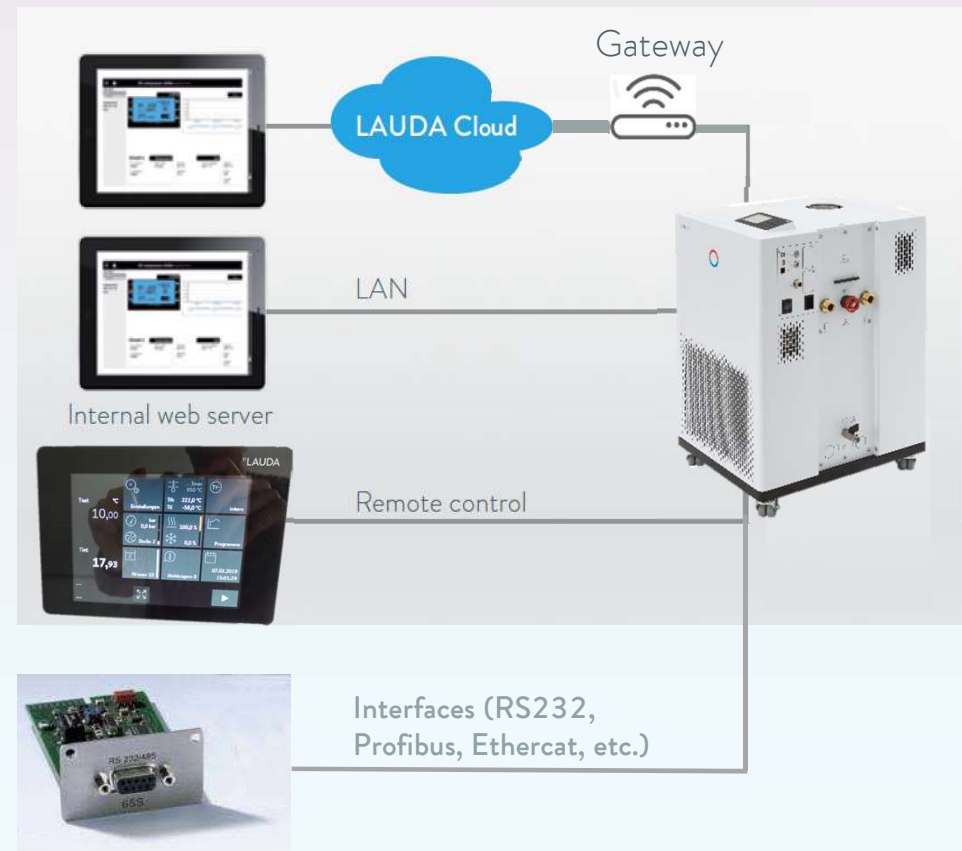
## 2. CONNECTIVITY SOLUTIONS

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# CONNECTIVITY SOLUTIONS

Communication online, offline, remote or on site – whatever you need

- Integrated webserver via Ethernet to computer or local LAN
- PT100 socket and alarm contact for process control
- USB ports for updating and datalogging
- Remote control panel Command Touch (accessory)
- Interface modules RS232, Profibus, Ethercat, etc. for digital communication (accessory)
- LAUDA IOT Cloud connectivity for online monitoring (accessory, in preparation)



# INTEGRAL OPERATING CONCEPT

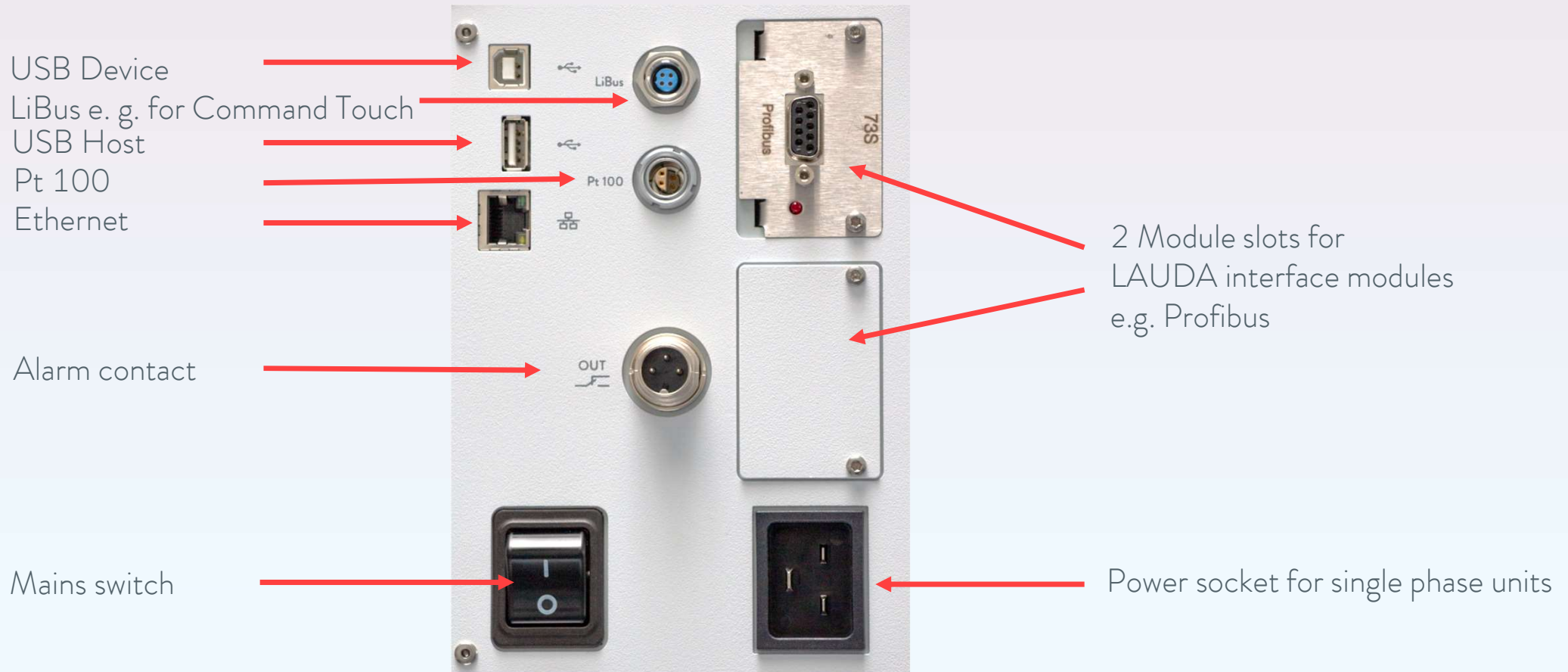
Modern, intuitive control - Command Touch



The remote control unit “Command Touch” allows smartphone-like touch configuration (2-finger zoom, etc.) in 8 different languages

# INTEGRAL INTERFACE CONCEPT

On devices with smallest housing A all interfaces are at the side of the unit



# INTEGRAL INTERFACE CONCEPT

Interfaces separated at units with tower housings B and C



Ethernet  
USB Host  
USB Device

Pt 100 (T ext)  
LiBus  
e. g. for  
Command Touch  
Alarm contact



2 Module slots for  
LAUDA interface  
modules

# CONNECTIVITY SOLUTIONS

Internal web server for computer / HMI control

- Connection to computer or internal LAN
- Standard Ethernet connection
- Same interface and functionality as within the control display
- Data capture possibility
- No internet connection necessary





# CONNECTIVITY SOLUTIONS

## Interface modules

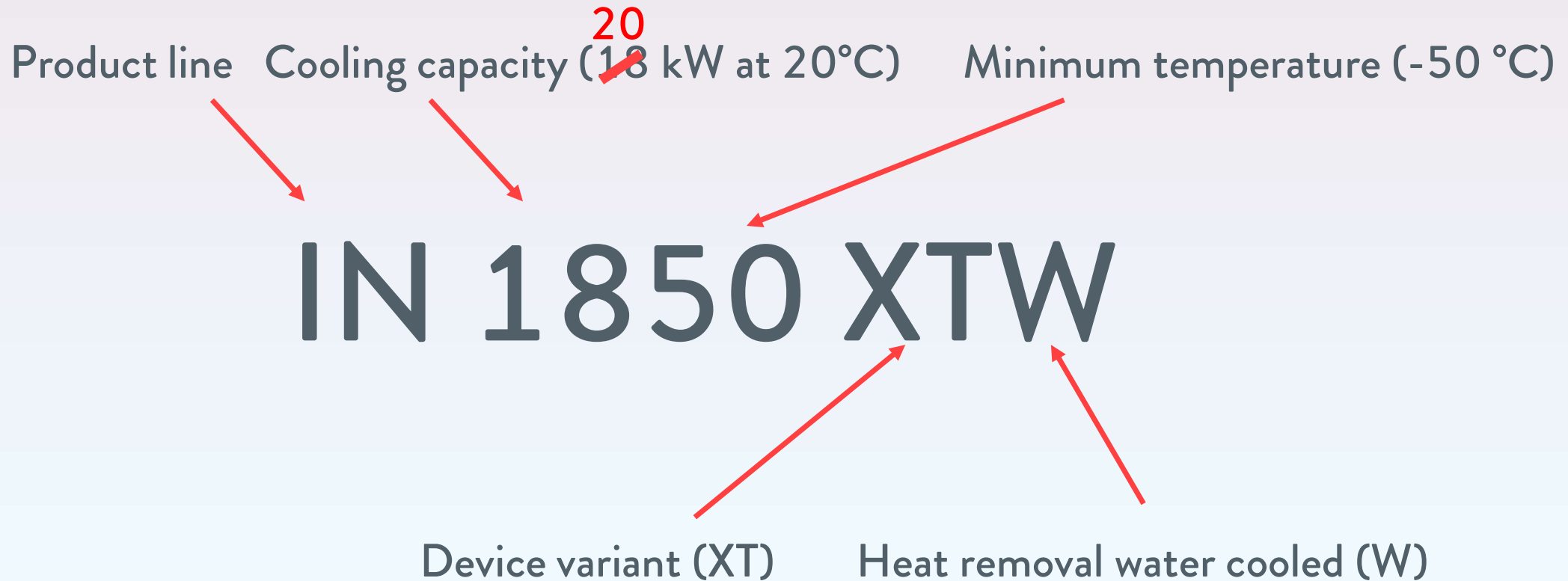
- Various Interface modules like RS232, Profibus or Ethercat are available as accessory
- Standardized digital protocols according to their specification
- Defined set of parameters to remotely monitor and parametrize Integral T and XT



### 3. TIMELINE AND AVAILABILITY

## DESIGNATION DEVICE TYPES

Concept from ECO and PRO transferred to Integral consequently



# OVERVIEW DEVICE TYPES UNIT VARIANT T

Group 1: Release for sale

Order number	Device type	Temperature Range	Heating power [kW]	Cooling capacity [kW]	Power supply	Housing	Reference type (old)
L002663	IN 130 T	-30 ... 120	2,5 kW	1,40 kW	230 V; 50 Hz	A	T 1200
L002664	IN 230 T	-30 ... 120	2,5 kW	2,20 kW	230 V; 50 Hz	A	T 2200
L002666	IN 530 T	-30 ... 120	8,0 kW	5,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	T 4600
L002668	IN 1030 T	-30 ... 150*	8,0 kW	11,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	C	T 10000
L002665	IN 230 TW	-30 ... 120	2,5 kW	2,30 kW	230 V; 50 Hz	A	T 2200 W
L002667	IN 530 TW	-30 ... 120	8,0 kW	6,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	T 4600 W
L002669	IN 1330 TW	-30 ... 150*	16,0 kW	13,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	C	T 10000 W

\* 150°C as standard

# OVERVIEW DEVICE TYPES UNIT VARIANT XT

Group 1: Release for sale

Order number	Device type	Temperature Range	Heating power [kW]	Cooling capacity [kW]	Power supply	Housing	Reference type (old)
L002673	IN 150 XT	-45 ... 220	3,6 kW	1,50 kW	230 V; 50 Hz	A	XT 150
L002675	IN 550 XT	-50 ... 220	8,0 kW	5,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 550
L002677	IN 750 XT	-45 ... 220	8,0 kW	7,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 750
L002674	IN 250 XTW	-45 ... 220	3,6 kW	2,10 kW	230 V; 50 Hz	A	XT 250 W
L002676	IN 550 XTW	-50 ... 220	8,0 kW	5,80 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 550 W
L002678	IN 950 XTW	-50 ... 220	8,0 kW	9,50 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 950 W
L002680	IN 1850 XTW	-50 ... 220	16,0 kW	20,00 kW	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	C	XT 1850 W

# OVERVIEW DEVICE TYPES UNIT VARIANT XT

Group 2 :Release for quotations

Order number	Device type	Temperature Range	Heating power [kW]	Cooling capacity [kW]	Power supply	Housing	Reference type (old)
L002684	IN 280 XT	-80 ... 220	4,0	1,60	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	A	XT 280
L002685	IN 280 XTW	-80 ... 220	4,0	1,70	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 280 W
L002687	IN 590 XTW	-90 ... 220	8,0	4,50	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	B	XT 490 W
L002689	IN 1590 XTW	-90 ... 220	12,0	18,50	400 V; 3/PE; 50 Hz & 460 V; 3/PE; 60 Hz	C	XT 1590 WS

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## 4. ACCESSORIES

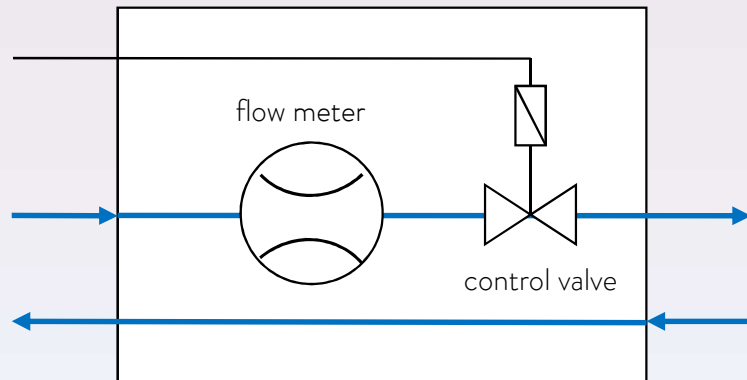
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# FLOW MEASUREMENT AND FLOW CONTROL

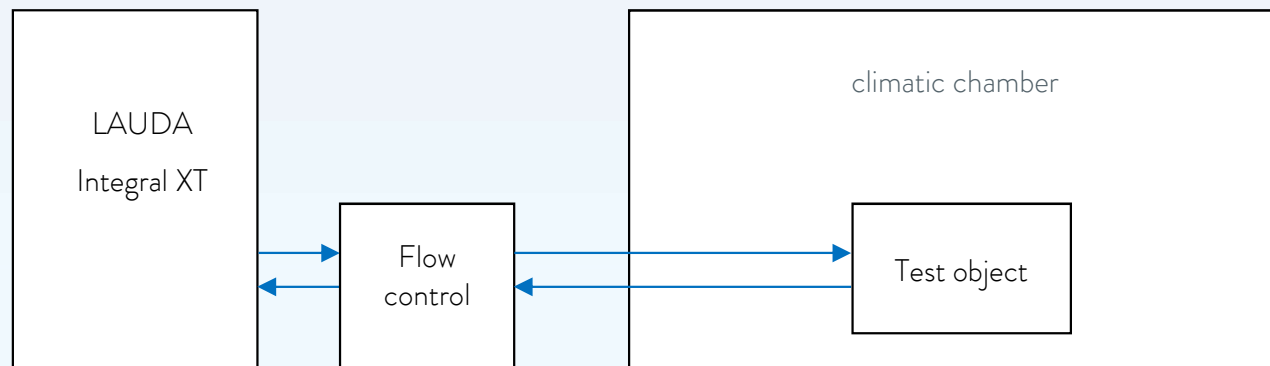
Accessory for Integral XT – Control of conductive liquid flow up to 20 l/min



Schematic layout of a flow control unit

Advantage of flow control device:

- High measuring accuracy
- Calibratable
- Flow rates up to 20 l/min



# ACCESSORIES

New solutions and “standard” range of accessories known from old Integral T / XT

- Interface modules
- Remote display (Command touch)
- Adapters, hoses, valves
- Heat transfer liquids
- IOT Cloud solution (in preparation)

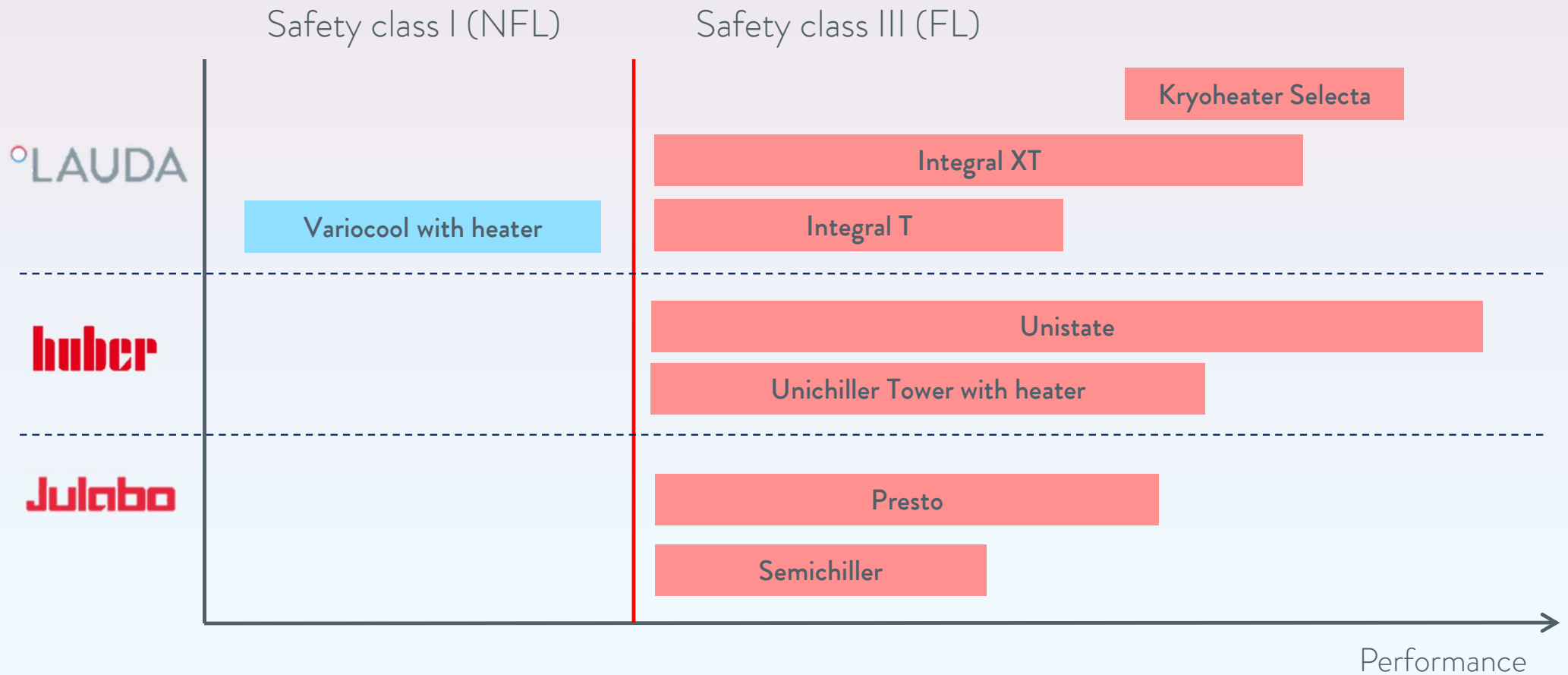


Menu allows setup for LAUDA heat transfer liquids -  
Optimized performance due to preset control parameters.

## 5. Competitive environment

# COMPETITORS PROCESS- AND CIRCULATION THERMOSTATS

## Overview



# PROCESS THERMOSTATS WITH FLOW SYSTEM



Presto  
A45



Unistat 430



Integral  
IN 550 XT



Unistat 510

# CIRCULATION THERMOSTATS FOR MODERATE TEMPERATURE RANGE

Economical entry in powerfull circulators



Varicool  
VC5000  
-20 bis 80°C



Unichiller  
055T-H  
-20 (-10) bis 100°



Semichill  
SC5000a  
-20 bis 80 (130)°C



Integral  
IN 530 T  
-30 bis 120°C

# CONTROL UNITS PROCESS THERMOSTATS

The new Integral – Tactile feedback via buttons or modern touch control



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## 6. SUMMARY

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# SUMMARY – KEY BUYING FACTORS

Future integrated.

- Integral thermostats are proven for more than 20 years, worldwide.
  - We used the experience of thousands of high-performance thermostats to integrate the future into Integral T / XT while maintaining a well-proven product design concept.
- The Integral is now smart, digital-fit and future-proof. All physical and digital interfaces allow a maximum of connectivity and integration.
  - No matter if an application may not need a remote control or cloud solution today, the Integral is ready! From local adjustment to global monitoring and control within closed-networks or via LAUDA-cloud, the Integral offers more efficiency, higher uptime and lower maintenance needs.
  - Handling, configuration and monitoring has become more simple and more comfortable.
- Last but not least, we not only increased connectivity but cooling and heating performance, flow rates and pump pressure.
  - The Integral is not only intelligent but powerful!

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