

withdrawable

SPS

Removable functional units



From technology to solutions

Electric panels are the basis for all distribution and command/control functions for industry and the services sector.

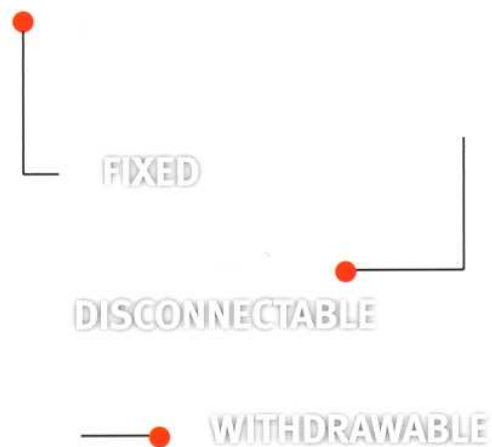
As a key element, they must be defined as precisely as possible to ensure they comply with application requirements.

To optimise your equipment, SERVELEC helps you to define your needs by analysing the following criteria:



- Environmental conditions
- Continuous or discontinuous process
- Properties of the upstream and downstream electrical networks
- Operational requirements
- Centralised data management requirements
- Maintenance policy
- ...

Following this analysis, several solutions may meet your specific needs. This is why SERVELEC has developed the SPS system - a full, homogeneous range of control panels in three product families:



A full range

Three product families to find the technical cost-effective solution to your problems.

All three product families share standardised components

The three SERVELEC families are based on the same smart system, structure and standard components to optimise costs and harmonise maintenance.

Upgradeability

Whatever product family you opt for, you can always change your mind at a later date without having to start from scratch. The families are intercompatible.

You can also add centralised control to systems which were not initially designed to handle this function. Progressive upgradeability of new integrated administrator versions is guaranteed.

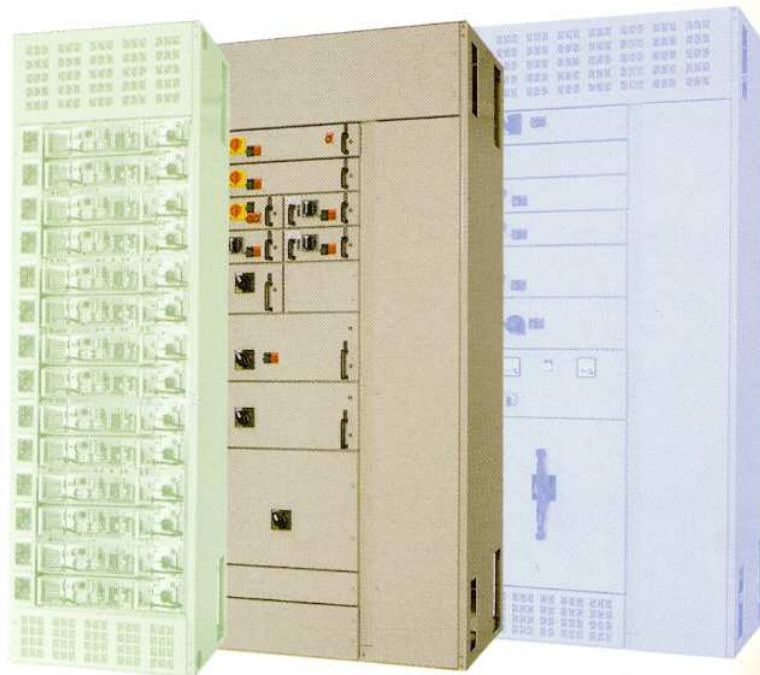
Maintainability

Maintenance access does not penalise operations.

Problems can be anticipated to reduce maintenance costs.

Open

Apparatus from every manufacturer can be used in the SPS product range.



Recognised technical expertise

State of the art design system using leading edge technologies.

Operating safety

The safety of the installation and operators is assured in all SPS products by the use of optimised components and implementation in total compliance with ever relevant standard.

Respect of standards

Design of all range of products complies with major standards.

From technology to concepts

Safety

The safety of the installation and operators is preserved when SPS is used and during its implementation:

- Compliance with IEC 439-1 standard
- "Type Test Assembly" classification
- Separation of functional units by design (minimum form 3b)
- Choice of safety and control / command components (selectivity - co-ordination).

Upgradeability

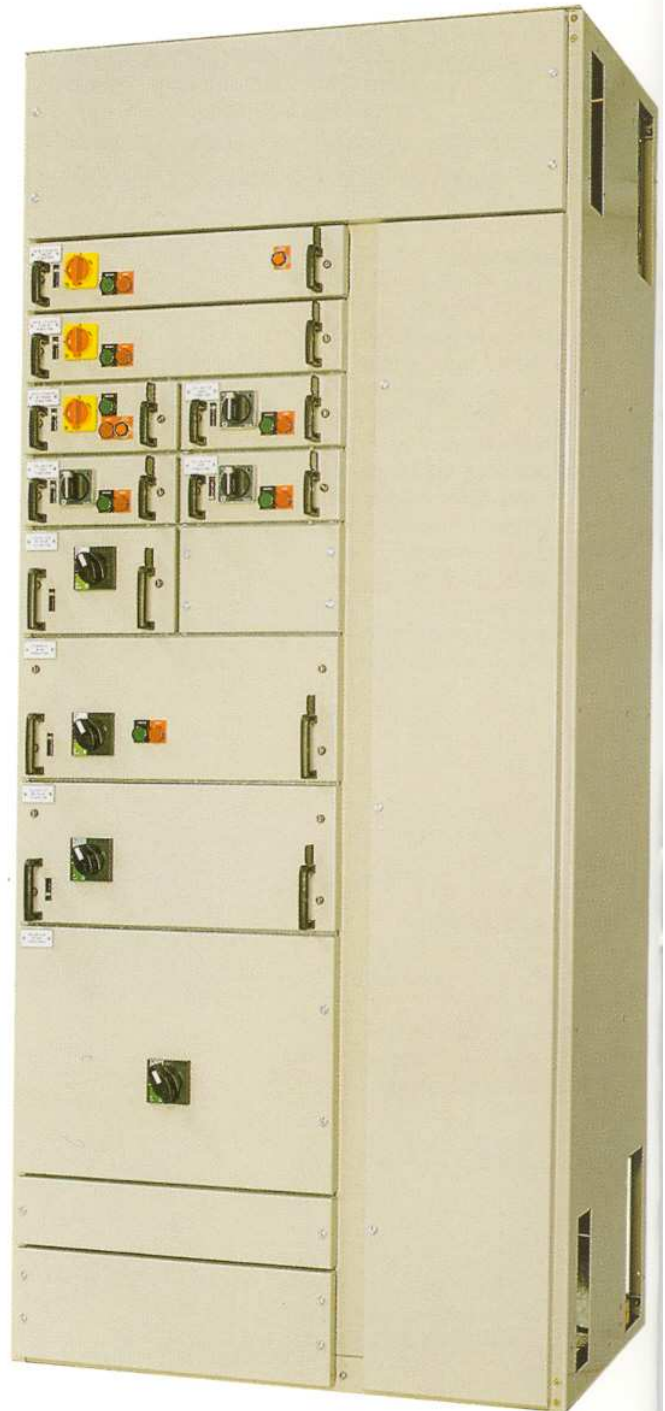
Panels can be upgraded without shutting down the complete system and in total safety for the electrician:

- The addition of new functional units
- Alterations to control panel layouts
- ...

Operations

SPS system panels and functional units are designed for use by personnel unqualified as electricians. Drawers are fitted with:

- Position indicators
- Mechanical fool-proofing devices preventing any handling when the functional unit is energised.
- Every position of the functional unit can be secured by a padlock.



Maintainability

Servicing and maintenance interventions can be executed on each functional unit separately without interrupting the rest of the panel.

- Functional units are interchangeable
- Thermographic monitoring of busbars connections and connection points on each functional unit.

...

Test position

Physical position of a functional unit used to test that all control / command circuits are operating correctly (this position is padlockable and indicated on the front face).

Installation

Connection volumes are spaciouly sized. External connections are simple and totally risk-free for users.




Front connection



Rear connection



All columns are modular and divided into three functional spaces:

-  - Busbar space
-  - Switchgear space
-  - Connection space

From technology to concepts

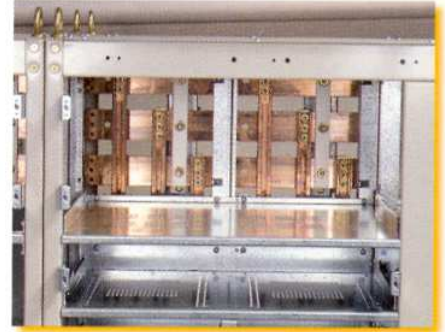
BUSBAR SPACE

Horizontal busbar sets

Housed in an insulated compartment in the upper section, the horizontal busbar set can be accessed from the front or top. There can be one or several stripped copper busbar sets per phase on functional moulded polyester + glass fibre compound supports (UL94-V0).

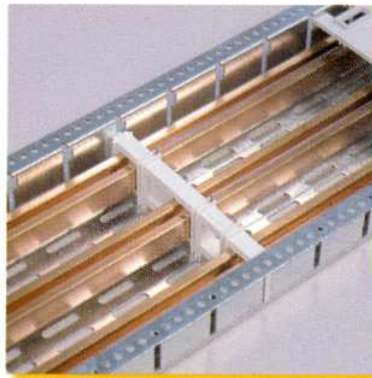
All busbar ends are standardised, drilled and fish-plated to ensure inter-cell continuity.

The neutral is located in the lower section and can be accessed from the front panel for four pole-terminal versions.



Vertical busbar sets

Three or four C-profiled copper strips - the vertical busbar sets - are housed in an insulated space behind the switchgear compartment. The insulated pin passthrough shielding and the supports are made from moulded polyester + glass fibre compound (UL94-V0).



Called the distribution shield, this sub-assembly is assembled separately and inserted from the front of the column.

Columns can be equipped with two distribution shields (3 or 4 phases). It is also possible to include phase separators to insulate the copper profiles from each other.

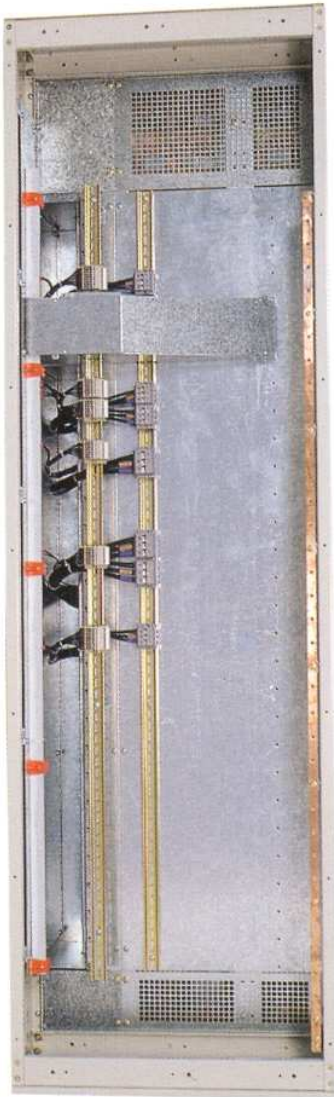
Safety leads

Metal mass electrical continuity, depending on the short-circuit current, is via 200mm², 250mm² or 380mm² stripped copper safety leads bolted to the structure.

This circuit comprises:

- A horizontal lead in the lower section
- A vertical lead in the connection compartment enabling connection of the safety leads of each external conductor.

CONNECTION SPACE



Connection compartments are designed to house power cables and auxiliary external conductors.

It includes:

- Power and auxiliary terminals for functional units
- Auxiliary collectors
- Cable supports for cable attachment.

The emplacement of this compartment depends on front or rear access.

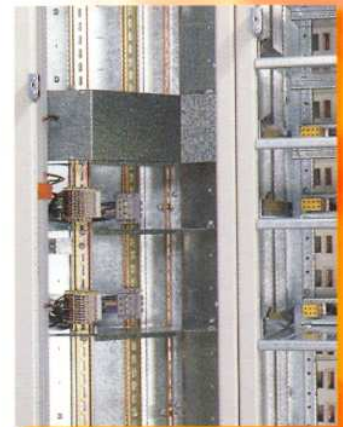
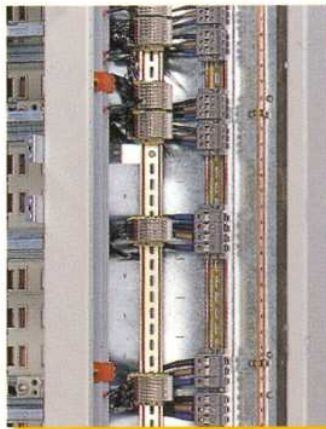
Rear access

In this case the compartment is located behind the column.

Front access

In this case the 400 mm width compartment is located on the right of the column.

External conductors can exit from column tops or bottoms. Separation by barriers or partitions between operational unit terminals enables insulation and isolation upgrade from form 3b to 4b.



From technology to concepts

SWITCHGEAR SPACE

All the functional units are housed in the switchgear compartment.

Functional units are standardised and, for a given rating, interchangeable, whatever the connection method adopted.



Set of withdrawable functional units.
Dimensions D2/D3/S2



Electrical test of S4 drawers



630 A functional unit

Useful height is divided into 28 modules (62,5 mm).

Each functional unit occupies a whole number of modules. Minimum size is two modules (125 mm). One column can house 14 functional units of 2 modules (S2 drawer).

The number of functional units per column can be doubled by adding a second distribution shield - i.e. 28 functional units of 2 modules (D2 drawer).

There are four operating positions:

- A Connected position
- B Test position
- C Isolated position
- D Removed position

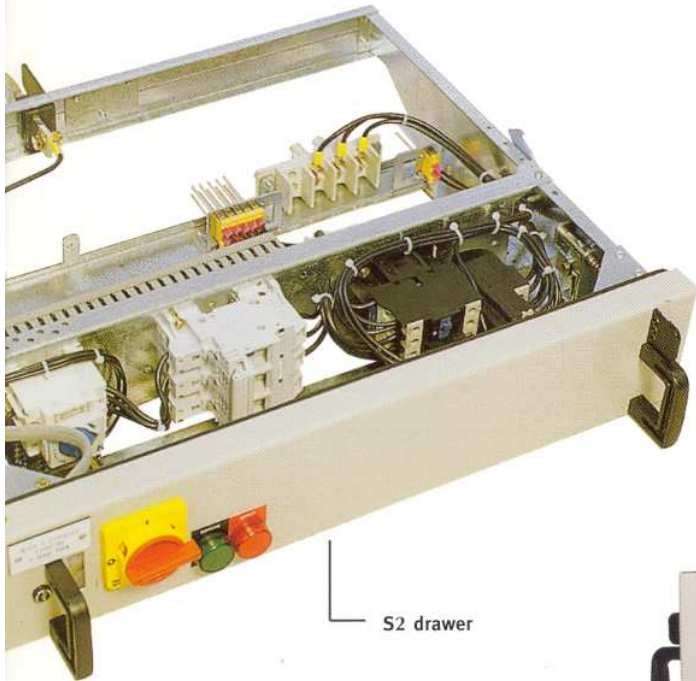
Operators can see the position selected on the front of the drawer. Positions can be locked with three padlocks.

In the standard configuration, in positions A., B. and C. the front panel of the drawer can be opened with a tool to:

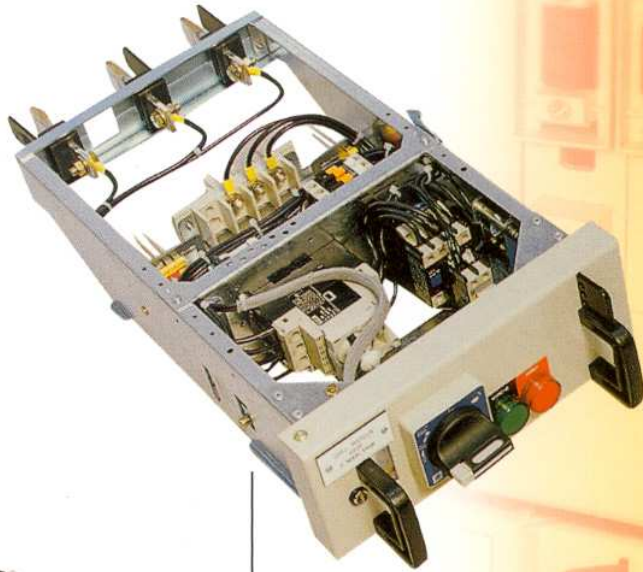
- Adjust the safety system
- Execute a thermographic control (option).

Closing the front panel automatically restores the drawer to the normal operating mode (maximising operator safety).

A fool-proofing system can be used which ensures that units can only be plugged into specific sockets.



S2 drawer

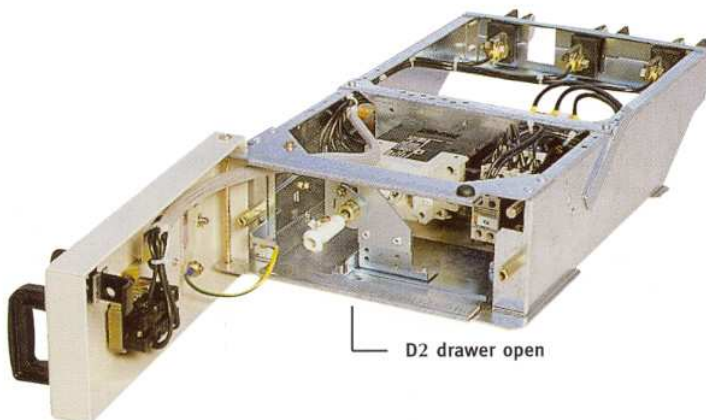


D2 drawer (DOL \leq 11 kW)



S3 drawer with thermographic test option

Drawers have hinged front panels with a power cut-out / control handle and control / display auxiliaries.



D2 drawer open

Drawers house the power and auxiliary switchgear required for control / command functions, safety systems and functional unit control.

A mechanical locking system prevents the insertion and removal of withdrawable units when the drawer is energised.

From technology to results

Electrical characteristics

Rated insulation voltage U_i	1 000 VAC
Rated operation voltage U_e	690 VAC
Rated frequency	50/60 Hz

	Main busbars	Distribution busbars
Rated current	800 to 3 200 A	1 000 A
Rated short-time withstand current I_{cw} (1s)	50 - 70 - 100 kA	50 - 70 kA
Rated peak withstand current I_{pk}	100 - 160 - 230 kA	100 - 160 kA

Normal service conditions

Installation : indoors.

Ambient air temperature: minimum -5°C ; maximum: $+40^{\circ}\text{C}$.
(average T° over 24 hours $\leq +35^{\circ}\text{C}$)

Relative humidity: 50% at 40°C

Altitude : $\leq 2\ 000\text{m}$

Pollution degree: ≤ 3

Design and construction

Classification: Type-tested assembly (TTA) or Partially type-tested assembly (PTTA)

Access connections: front or rear

Cable entry: bottom and top

degree of protection : IP 31 to IP 54

EZ metalsheet with polyester powder coating

Insulation equipment: V0 Class according to UL 94

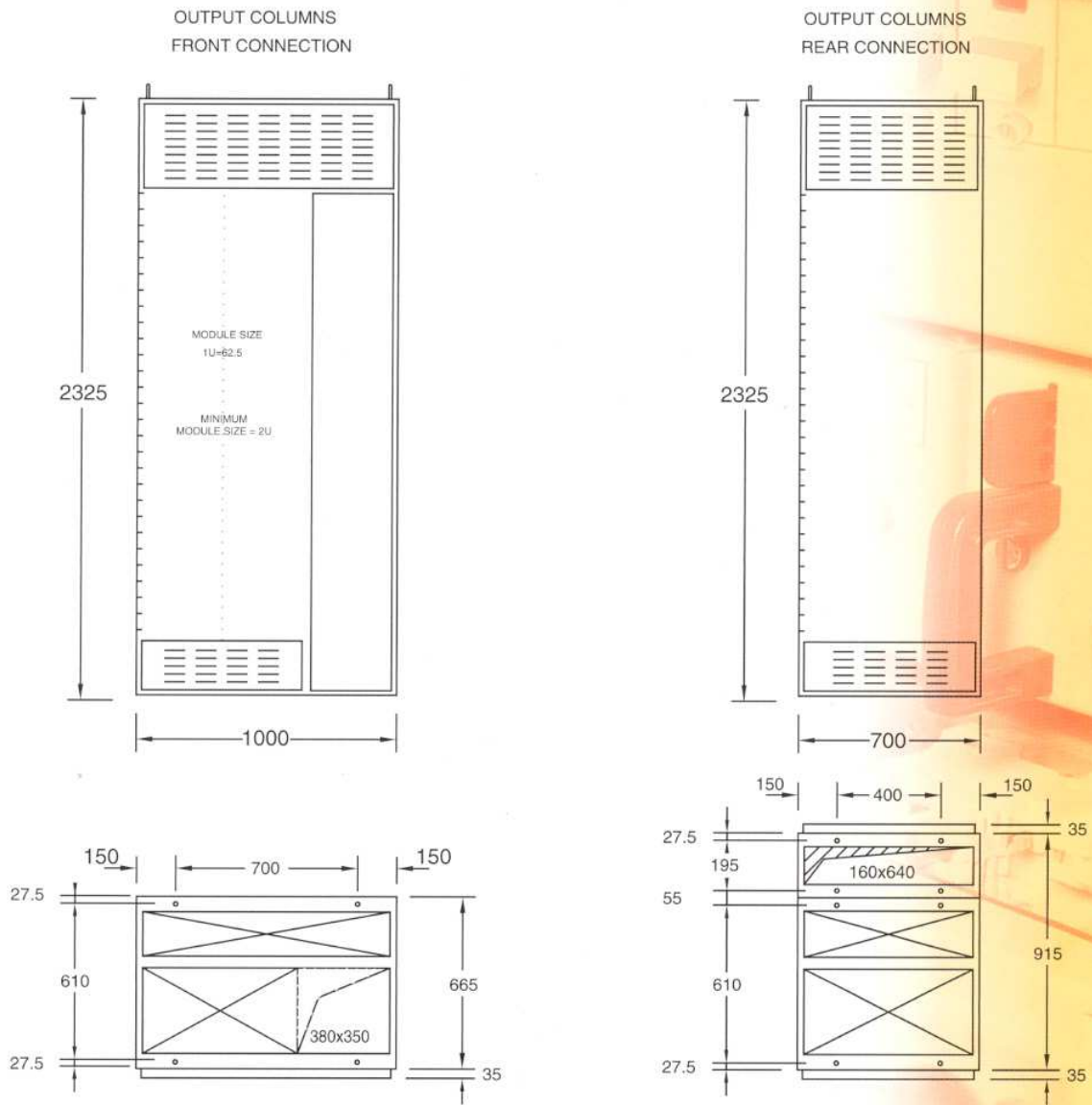
Internal separation: form 3b to 4b

Electrical connections of functional units: W W W

Service index: 333

Output cell dimensions	Front connection	Rear connection
Height	2 325 mm	2 325 mm
Width	1 000 mm	700 mm
Depth	700 mm	985 mm

Dimensions



Floor mounting

- Columns must stand flat to within 2 mm
- Direct bolting to floor or to attachments embedded in floor with M12 bolts (not supplied)

Installation

- After assembling the columns:
- Ensure main busbars continuity
 - Ensure auxiliary collector continuity
 - Ensure safety circuit continuity.

Since our foundation, SERVELEC has always given top priority to imagination, the will to succeed and service. The experience acquired and the capacity for adaptation have made SERVELEC leaders in the design and manufacturing of low voltage system.

Key

figures

- Sales: 10 000 000 €
People: 70
- Industrial capacity:
100 000 hours of which 20 % is devoted to research
- Floorspace: 5 500 sq.m. Site area: 1.7 ha.

The SERVELEC approach

Client-centred organisation

Awareness, requirement analysis, discussion, reactivity and availability are the success factors in meeting the needs our customers and building long-term relationships.

Progress through innovation

Continuous system development, staying on the leading edge of technology by giving every opportunity to creative flair through an on-going quest for excellence.

People and know-how

People come first at SERVELEC and all members of our company continuously refresh their skills and know-how. Reception, sales, research and development, purchasing, production, tests and warehousing... all the different links in the chain are vital. Everyone is important and free to voice their opinion.

One priority objective: Quality

Quality is present at every phase from system design to implementation. Servelec had already achieved ISO 9002 certification in 1993 – official recognition and an additional guarantee for the industrial who have chosen us.

A new

view of service

SERVELEC provides a wide range of solutions for numerous industrial sectors (chemistry, petroleum chemistry, metallurgy, textile, automobile and food-processing) as well as service sector, local authorities and administrations. Co-operation and idea-centred discussions are our approach to developing the technological success stories of tomorrow.



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