



TECHNICAL DESCRIPTION

SOLNA D400



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Solna D400

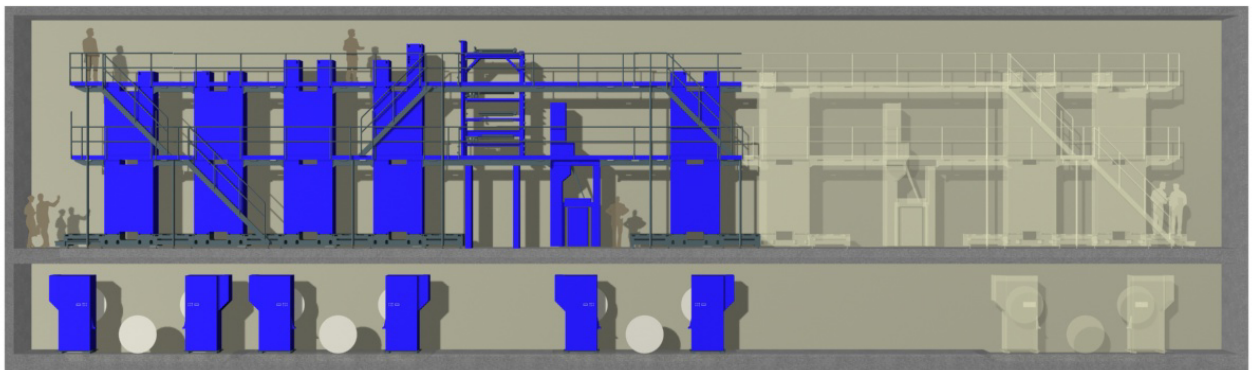
Introduction

The Solna D400 is a highly sophisticated, single circumference, single width web offset press with vertical web lead. It is designed for medium sized runs of newspapers, magazines, brochures, directories, books and other commercial printing on uncoated and coated stock.

As standard the press is equipped with a number of high-tech features for improved flexibility and productivity. Each perfecting unit is individually driven (shaftless). The ink fountains have motorized ink zone adjustments remotely controlled from a master console. The circumferential and lateral plate registers are motorized and adjustments are carried out remotely from the operators console. Plate and blanket cylinders are running without bearer contact (Multirange System). Fine adjustments can therefore be made to compensate for changes of stock thicknesses without disrupting the correct relationship between the cylinders. A guarantee for ideal dot transfer.

The Solna D400 is designed for a production speed of 55 000 cph. To be able to run this fast the press is equipped with three water-cooled oscillating rollers per inking unit and box type side frames on both the drive side and the operator's side of the printing unit.

The Solna D400 is designed to produce high print quality on uncoated and coated stock, to run with low operating costs, low waste costs and with a minimum of manning. The rigid and ergonomical design provides for very short make ready as well as for high quality and high performance reliability.



The first Solna Distributor 400 (D400) sold to Furness Newspapers Ltd, Cumbria, U.K.

The **Solna D400** is a modular system containing the following printing units and folders:

- **Printing unit D400 2-high**, two colour / single web perfecting assembly
- **Printing unit D400 3-high**, three colour / single web perfecting assembly
- **Printing unit D400 4-high**, four colour / single web perfecting assembly

All assemblies will have the possibility to run two webs. A free-standing automatic splicer per web is necessary. All printing units (perfecting units) are equipped with independent drive (shaftless) system, remotely controlled ink fountains, motorized circumferential and lateral plate registers and spray dampening system, remotely controlled from the master console.

A wide range of folders is also part of the Solna D400 concept. Each folder is designed for a specific application and type of production.

- **Folder F400 S**, a heavy-duty combination jaw folder with two around folding and jaw cylinder. The folder has a capacity to run up to 8 webs. This folder is most suitable for newspaper production up to 45 000 cph and for different types of demanding semi-commercial and commercial production.
- **Folder F400 C**, a heavy-duty jaw folder with a three around folding and jaw cylinder. The folder has a capacity to run up to 12 webs. The F400 C is designed for newspaper, semi-commercial and commercial production in high speeds.
- **Folder F400 W**, a heavy duty jaw folder with a three around folding and jaw cylinder. The folder has a capacity of up to 12 webs. This is the most advanced newspaper folder in the range. The folder is fully automated and is also equipped with a very advanced quarter fold mechanism for high speeds and up to 12 webs.

All of the folders above can be equipped with an upper section (balloon folder) for two or three sections. The folders are also equipped with independent drive (shaftless) system.

Part of the Solna D400 concept is also the control system – Solna PPC (Process and Printing Control System). This is a highly advanced system that gives total control of both the process and the print quality. The system is open and based on the market available standard components, which gives the possibility to integrated equipment and systems from other manufacturers: mailroom, management systems, scanners, CTP-systems etc.

The design philosophy of Solna is to base as much as possible on standard components. The result of this is higher availability of spare parts, easier service and longer lifetime of the individual parts.

For higher flexibility and pagination possibilities the Solna D400 concept also features a range of turner bars and bay-window arrangements that will be tailored to your needs.

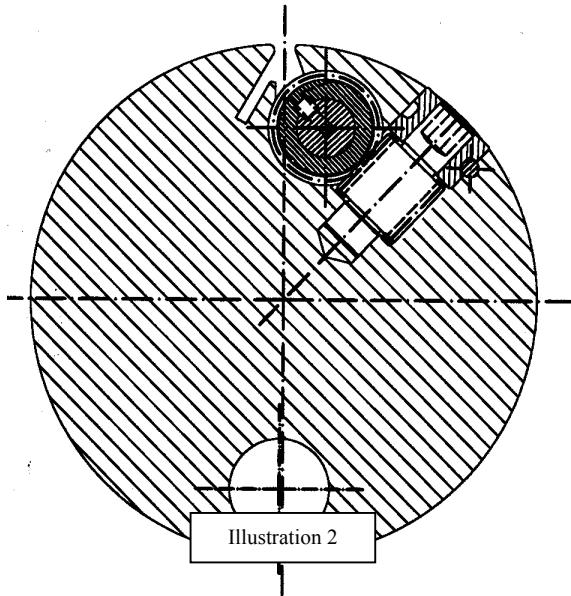
At high speeds and for demanding production, the importance of the splicers and the web tension control systems will increase very much. Solna works with all of the major suppliers in this field. Web tension devices and splicers can of course also be integrated into the Solna PPC-system. The very short stop time will minimise the risk of web wrapping. To add safety, Solna has designed its own web catching system. The system will cut the web and through a system of rollers collect the web in a separate container. This implies less risk of webs wrapping around cylinders, causing expensive down time.

To complete a press installation the towers and folders will be erected together with platforms, floor modules and superstructures. A complex variety of support systems such as: ink distribution systems, roll handling systems, process coolers and climate control systems are also available to take full advantage of the possibilities of the Solna D400 concept and at the same time assure a high and even quality in the production.

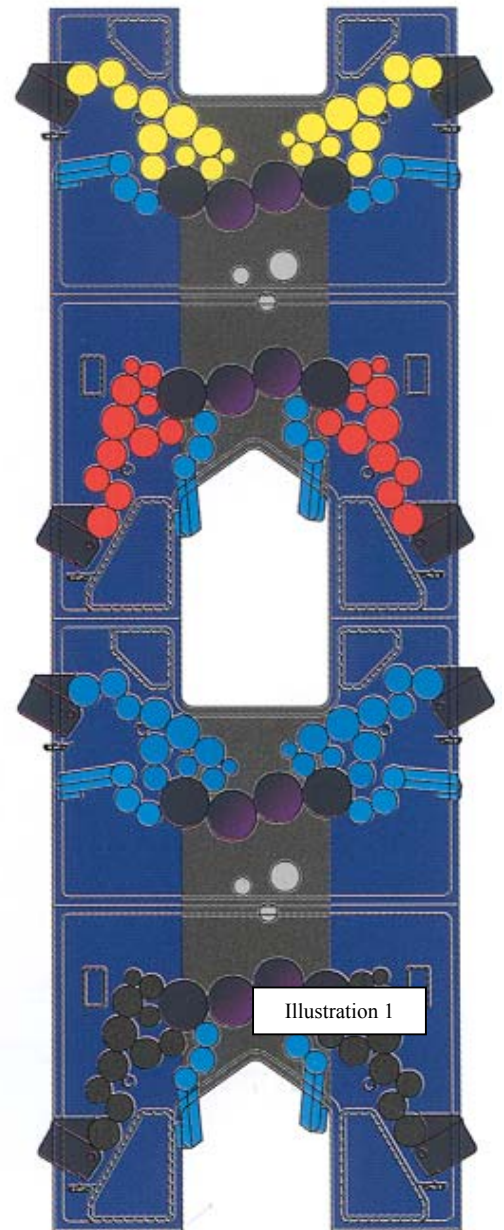
Printing units

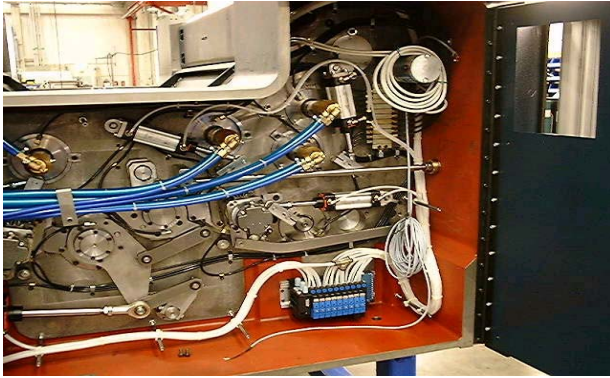
Standard features

- Modular perfecting units in 2-high, 3-high and 4-high vertical configurations (illustration 1)
- Cast iron, precision machined, box type side frames on both the drive and the operator's side
- Blanket cylinders in solid steel, nickel plated with reel type blanket lock-up (illustration 2)



- Plate cylinders in solid steel, nickel plated with slot (no tool) plate lock-up for full and half-size plates
- Multirange eccentric system with play-free, multiple-row bearing system and adjustable printing pressure during run
- Motorized and remote-controlled circumferential and lateral plate registers
- Inking system with three ink form rollers when using spray dampening
- Disconnectable ink units
- Separate on/off ink dampening and ink feed rollers
- Motorized, individually operated ink fountain rollers
- Motorized, remote-controlled ink fountains
- Spray dampening system, remote-controlled





- Oscillating rollers prepared for cooling by water
- Web tension device (infeed) for 4-high units
- Web break detectors
- Safety guards according to European Union Safety regulations (CE)
- Internal light fittings
- Independent (shaftless) drive on each perfecting unit (1+1)

Additional equipment

- Plate cocking device
- Pre register system for full or half plates
- Web tension device (outfeed) for 4-high units
- Web guide system in 4-high units
- Film dampening system
- Semi-automatic webbing-up device
- Automatic ink distribution system
- Automatic colour-to-colour register in 4-high units
- Blanket washers
- Web severing and clamping device
- Web catching device

Folder F400 S

Standard features

- Combination jaw folder mechanism, 1:2:2(:1), with retractable folding knives for broadsheet and tabloid products, maximum 8 webs
- Super structure with web lead rollers and draw rollers for maximum 8 webs from left and 6 webs from right, (total maximum number of webs = 8)
- Platform with ladder
- Individually driven (shaftless/variable speed) RTF roller with pneumatically operated nip rollers and slitter/perforator wheels
- Newspaper former with air in former bars and nose including blower
- Pneumatically operated nip rollers below former
- Signature overlap adjustment on the run
- Optic anti-jamming device and web severer
- Delivery table with independently driven delivery belt
- Safety guards in accordance with the European Union Safety regulations (CE)
- Internal light fittings
- Independent (shaftless) drive system

Additional equipment

- Quarter folding mechanism with automatic timing of the folding blade
- Double parallel cylinder
- Longitudinal perforation device for the spine of the quarter fold product
- Cross perforation device for the head of the quarter folded product
- Commercial former (max. 4 webs)
- Extended delivery table
- Sound absorptive wall
- Automatic cut-off control
- Additional cut-off compensators for special web lead arrangements
- Gluing device for broadsheet and/or quarter folded products
- Stitching device for tabloid products
- Balloon former (max. 4 webs) for a second section
- Angle bar arrangement for a third section (half web)
- Former for a third section (max. 2 webs)

Folder F400 C

Standard features

- Jaw folding mechanism, 2:3:3, for broadsheet and tabloid products
- Superstructure with web lead rollers and draw rollers for up to 10 webs (with an additional former up to 12 webs)
- Platform with ladder surrounding the folder superstructure
- Two RTF rollers, individually driven (shaftless/variable speed) with pneumatically operated nip rollers and slitter wheel
- Newspaper former 70° with air in former bars
- Set of former rollers, adjustable in all directions, without drive
- Drawing rollers (two pairs) under the former edge, consisting of a steel roller and a vulkollano-ring respectively steel-ring with a fixed overspeed of 0,11% of paper speed, distance adjustable in running mode (depending on the number of webs)
- Cutting cylinder with two knives
- Pin cylinder with three pin bars and three blades for the first cross-fold, action by driven cams and torsion springs, pre-fold adjustment in running mode effected by two sets of gears
- Pneumatic acted air brake
- Jaw cylinder with three folding jaws, driven by cams and torsion springs, adjusted together with the blade system of the pin cylinder
- Transport belt between folding cylinder and star wheel
- Star wheel with 10 sections, central adjustment for four wheels together as well as each wheel separately
- Delivery belt, with 80 mm copy spacing (standard but can be changed according to customer's request). Not adjustable
- Solna jam control system
- Web severer
- Safety guards in accordance with European Union Safety regulations (CE)
- Internal light fittings
- Independent (shaftless) drive system

Additional equipment

- Superstructure with two formers 70° (Balloon former), each with two individually driven RTF (shaftless/variable speed) with pneumatically operated nip rollers and slitter wheel including lead rollers and draw rollers for up to 12 webs
- Quarter folder with:
 - Rotary folding knife
 - Folding rollers (one pair), spring loaded, hard surface, running synchronous with the plate cylinder by the help of a planetary gear box that is adjustable on the run
 - Transport belts from jaw cylinder to the chopper
 - Product brakes with brushes
 - Star wheel delivery
 - Transport belt, direction in-line with the folder or parallel to the machine (up to customer's request)
 - Drive connection to the jaw folder with a toothed belt
 - Mechanical clutch
- Double parallel folder (maximum capacity two webs each maximum 52 g/m²)
 - Two systems in circumference, manually adjustable on the run with a hand wheel
 - Two spring loaded folding blades
 - Two spring loaded gripper systems
- Longitudinal perforation device (driven synchronous with the plate cylinder), fine adjustable on the run ± 5 mm. The system is positioned under the former for the perforation of the quarter fold
- Cross perforation device, adjustable on the run. Adjustment together with first crossfold with one pair of separate cylinders
- Automatic cut-off control
- Additional cut-off compensators for special web lead arrangements
- Gluing device for broadsheet products
- Stitching device for tabloid products
- Angle bar arrangement for a third section (half web)

Folder F400 W

Standard features

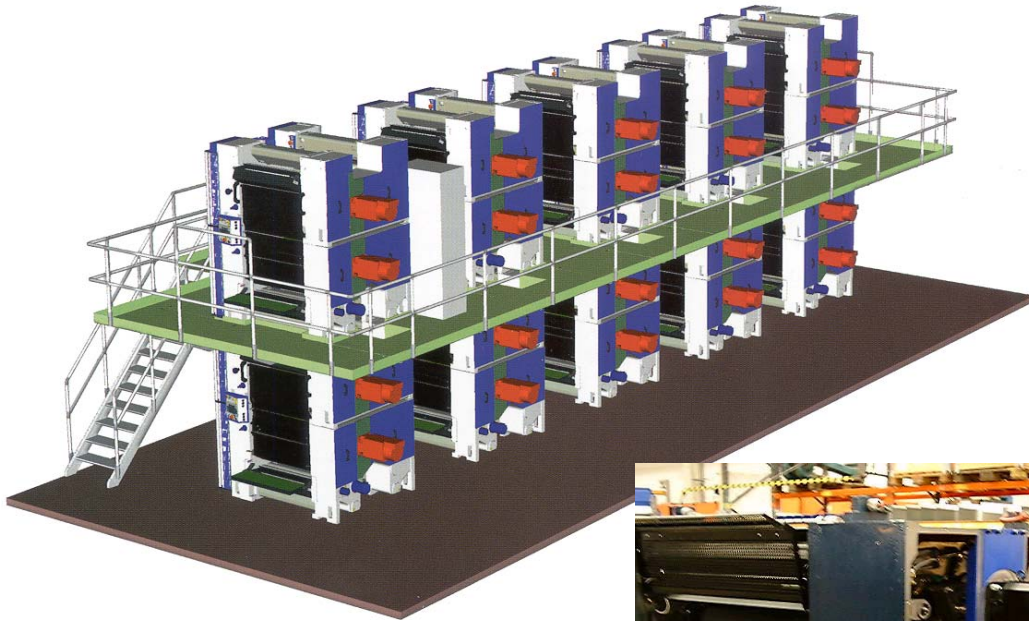
- Jaw folding mechanism, 2:3:3, for broadsheet and tabloid products (fixed product sizes, cut off and web width)
- Motorized adjustment of folding cylinder circumference
- Superstructure with web lead rollers and draw rollers for maximum 12 webs
- Platform with ladder surrounding the folder superstructure
- Double RTF rollers, individually driven (shaftless/variable speed) with pneumatically operated nip rollers and slitter wheel
- Newspaper former with air in former bars and nose
- Motorized nip rollers below former
- Signature overlap adjustments on-the-run
- Optic anti-jamming device and web severer
- Delivery table with independently driven delivery belt
- Safety guards in accordance with European Union Safety regulations (CE)
- Internal light fittings
- Independent (shaftless) drive system

Additional equipment

- Quarter fold mechanism for post fold up to 12 webs (192 pages)
- Extended delivery table
- Sound absorptive wall
- Automatic cut-off control
- Additional cut-off compensators for special web lead arrangements
- Gluing device for broadsheet and/or quarter folded products
- Stitching device for tabloid products
- Balloon former (max. 4 webs) for a second section
- Angle bar arrangement for a third section (half web)
- Former for a third section (max. 2 webs)

Drive and Control System

SHAFTLESS DRIVE SYSTEM with one AC motor for each printing unit and folder with system cabinet.



SOLNA PRINTING PROCESS CONTROL, including as standard

- **Master console** with PC computer and software, video screen with alarm display and sequential start to run the main press functions and the remote-controlled ink fountains, plate registers and dampening systems
- **Press master console** for connection to RIP or CTP-system, set-ups and supervision



Additional equipment

- Plate reader or computer for connection to plate (CTP) arrangement
- Console for auxiliary equipment control

Electrical System

The control system consists of a PLC and PC-units on a Ethernet-network. In a printing unit the press functions are controlled from a PLC in the bottom cabinet via buses on different communication levels to remote I/O units and the drive units. The press master console in a press system is the PLC in the main console. This master has the press configuration stored in a non-volatile memory. A PC is used in this console for press set-ups and supervision.

The remotely controlled ink fountain system is a part of the Solna Process and Printing Control System, which is a high precision presetting and press control function system, including a plate scanner or a direct interface to the RIP for presetting of the ink zones. This system also has provisions for storing and recalling job information for repeat press runs. The system provides an electronic overnight fountain blade shut-off feature.

The emergency stop circuit consists of two independent stop channels. Only approved safety components are used. The emergency stop of the press is supervised by a safety module in the press master console.

Internal control voltage is 24 V DC.

Maintenance and fault finding can be performed remotely, directly into the press control system, via a modem interface by Solna Sweden.



Plate up and maintenance, independently done in each printing couple

Press Supply equipment

Standard features

- Press equipment, floor bolts, cement, installation jigs, base foundation, unit superstructures with web lead rollers, connection parts, air and water pipes, platforms and ladders, spare and operators manuals and installation instructions
- Semi-automatic plate bender, electronically and pneumatically operated
- Water distribution system for spray dampening system
- Free-standing automatic splicer for max. 1250 mm (50") reels

Additional equipment

- Plate punch, electronically and pneumatically operated
- Reel handling system
- Compressor with air dryer
- Process cooling system
- Heatset equipment, infeed, dryer, chill roll stand, silicone applicator, etc.

Technical Data Printing Units and Folders

Printing units D400

Cylinder circumference	mm	546	560	578	630
Maximum printing length	mm	535	549	567	619
Maximum web width	mm	840	915	915	1000
Plate dimensions length	mm	578	592	610	662
Plate dimensions width	mm	860	950	950	1025
Plate dimensions thickness	mm	0.3	0.3	0.3	0.3
Blanket dimensions length	mm	596	610	628	680
Blanket dimensions width	mm	845	935	935	1010
Blanket dimension thickness	mm	1.95	1.95	1.95	1.95
Blanket dimension underpacking	mm	0.25	0.25	0.25	0.25
Blanket dimension total	mm	2.20	2.20	2.20	2.20
Register adjustments, lateral	mm	± 3	± 3	± 3	± 3
Register adjustments, circumferential	mm	± 3	± 3	± 3	± 3
Register adjustments, diagonal (opt.)	mm	± 0.1	± 0.1	± 0.1	± 0.1

Folder F400 S

Maximum guaranteed production speed	broadsheet/tabloid	45.000 cph
Maximum guaranteed production speed	quarter fold	35.000cph
Maximum number of webs		8
Maximum total paper weight per square meter		450 gsm
Maximum number of pages	broadsheet	32
	tabloid	64

Folder F400 C

Maximum guaranteed production speed	broadsheet/tabloid	55.000 cph
Maximum guaranteed production speed	quarter fold	40.000cph
Maximum number of webs		12
Maximum total paper weight per square meter		540 gsm
Maximum number of pages	broadsheet	48
	tabloid	96

Folder F400 W

Maximum guaranteed production speed	broadsheet/tabloid	55.000 cph
Maximum guaranteed production speed	quarter fold	40.000cph
Maximum number of webs		12
Maximum total paper weight per square meter		540 gsm
Maximum number of pages	broadsheet	48
	tabloid	96

Speeds are valid for uncoated paper.

Copy spacing Adjustable between 40 and 120 mm. F400C fixed 80 mm or on request.

Emergency stop The press is designed to stop within 4 seconds.

**Static / dynamic load
at each floor bolt**

	Static load	Dynamic load
4 high arrangement	70.000 N	20.000 N
F400 S folder	26.000 N	10.000 N
F400 G folder	21.000 N	9.000 N
F400 W folder	60.000 N	18.000 N
F400 C folder	20.000 N	5.000 N

Power

Drive motor/printing unit	32 kW
Drive motor/folder	30 kW (with F400 C folder 35 kW)
Drive motor/suction roller (each)	11 kW (with F400 C folder 2 x 5 kW)

Dampening water and additives

General recommendations

Cleaners and water additives must be proved to have a low tendency to corrode. Corrosion in an offset press is very dependent on the constitution of the dampening fluid, where a high percentage of salts implies a higher receptivity to corrosion.

The pH-value of the dampening fluid generally falls within the range of 4.5–6. In order to keep the pH-value of the dampening fluid constant, even if the amount of water additives varies, the modern water additives contain special acids and alkalines (buffering). The manufacturer's instructions for dosage must be strictly followed.

Note that, if not otherwise restricted by the printing process, the pH-value may well be over 6. In the case of nickel layered cylinders the pH-value should be over 4.8.

Restricted substances in the dampening water

If the concentration of these substances exceeds the recommended value, the Solna warranty is not valid.

Substance	Maximal amount
Chlorides	40 mg/l
Sulphates	50 mg/l
Nitrates	20 mg/l

Note that these are the maximum values. The actual value may well be lower. Regular checks that these conditions are satisfied can significantly reduce the risk of corrosion caused by the dampening water.

The quality of water shall correspond to the established limits in W.H.O. 1984 "Guidelines for drinking water".

Operating conditions

The Solna electrical equipment is designed to fulfil EN 60 204-1. Some of the most important conditions are given below:

Voltage	400VAC \pm 10 %
Frequency	50/60 Hz \pm 1 %
Voltage impulses	Not to exceed 1.5 ms in duration with a rise/fall time between 500 ns and 500 μ s and a peak value not more than 200 % of the rated r.m.s. supply voltage.

Ambient air temperature

In the press room	Within + 5° C to + 40° C.
In transport and storage	Within – 25° C to + 55° C.

Humidity

Within a relative humidity of 30 % to 95 %, non condensing.

If an earth fault relay is intended to be used, it should be discussed with Solna in advance.