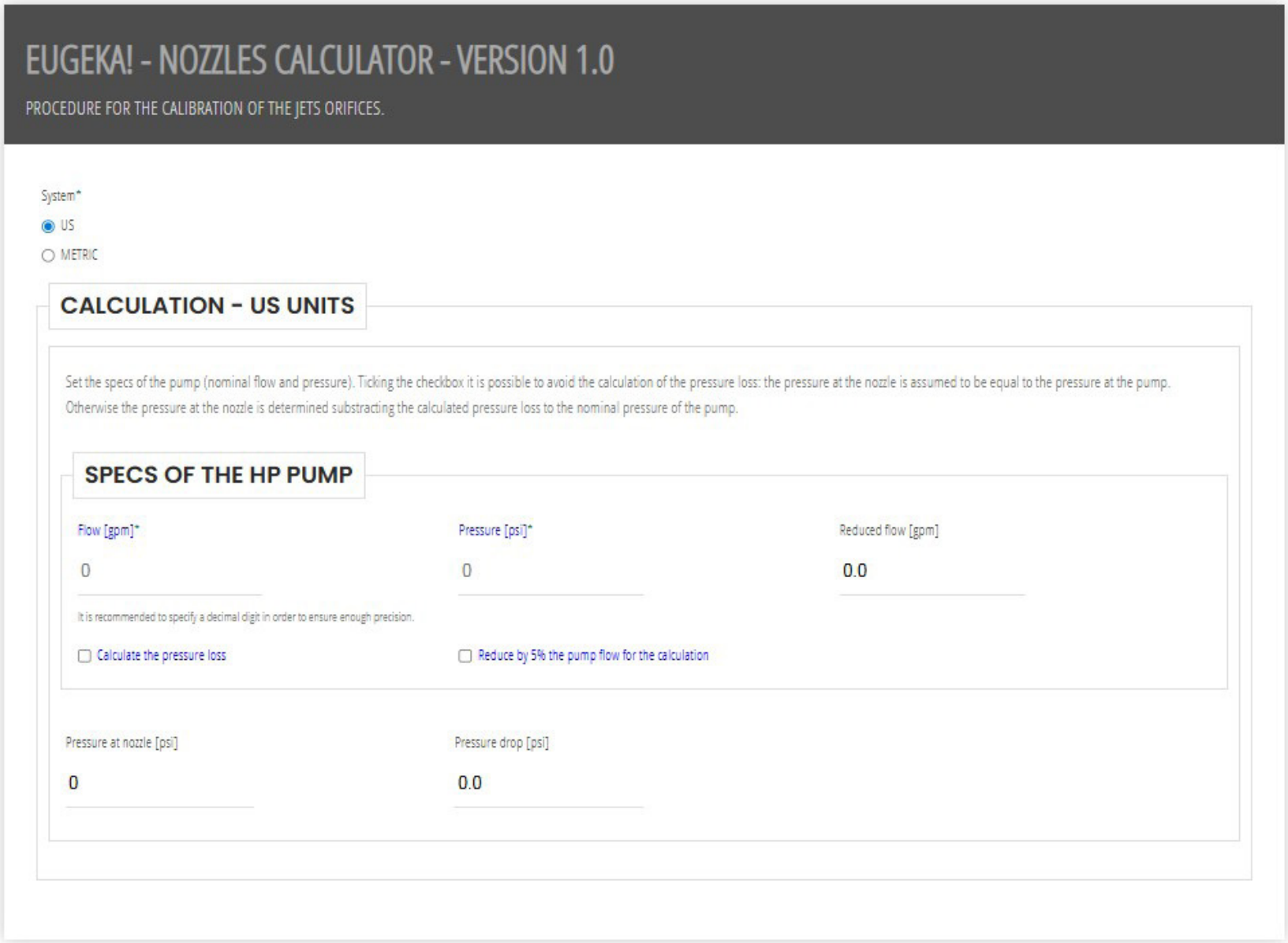
Section 0: Selection of the system of measurement units

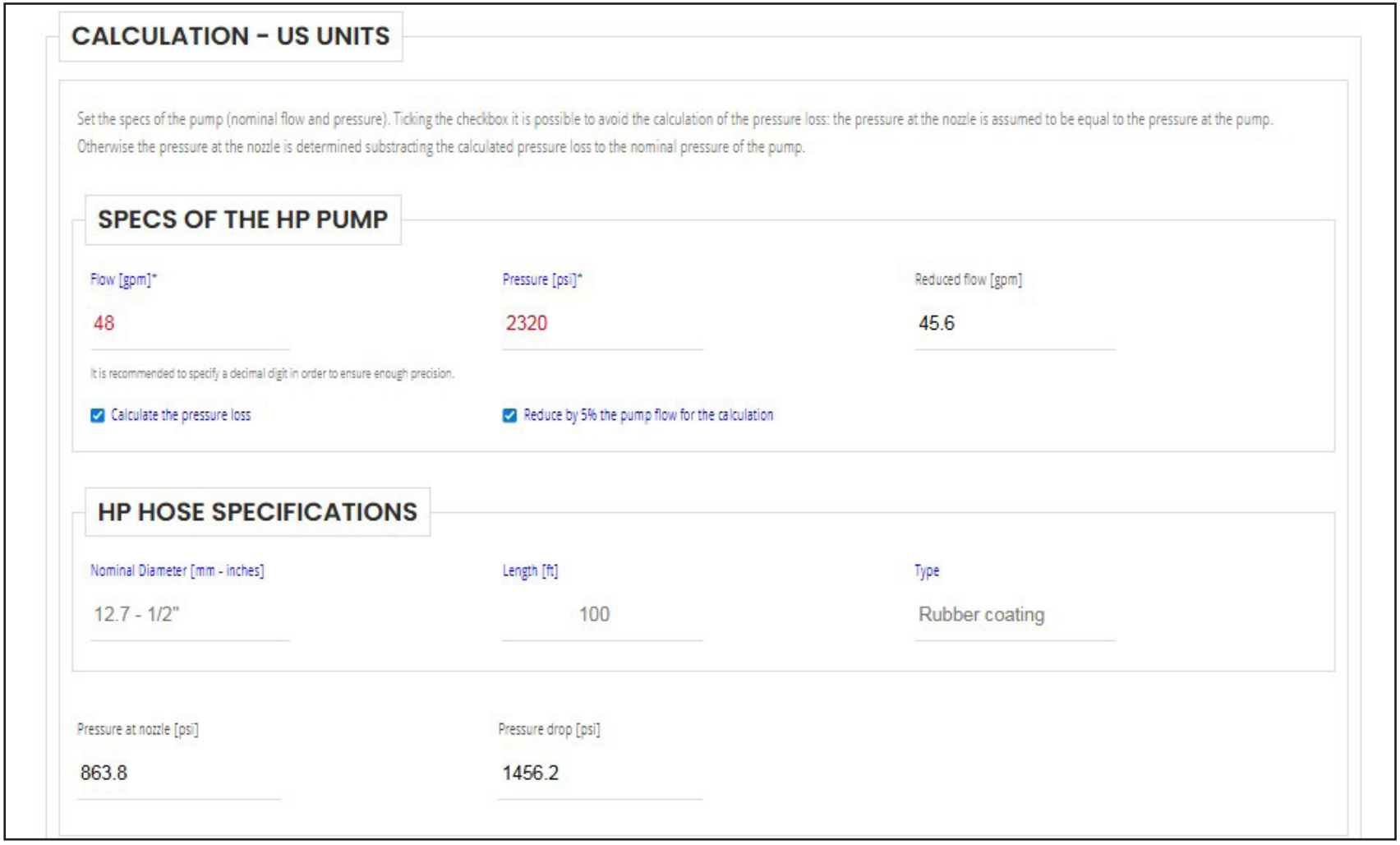
Choose between US and METRIC for the measurement units system.

The form fields with a blue label are for data entry (the symbol "*" means the entry is mandatory).

Section 1: Specifications of the HP pump

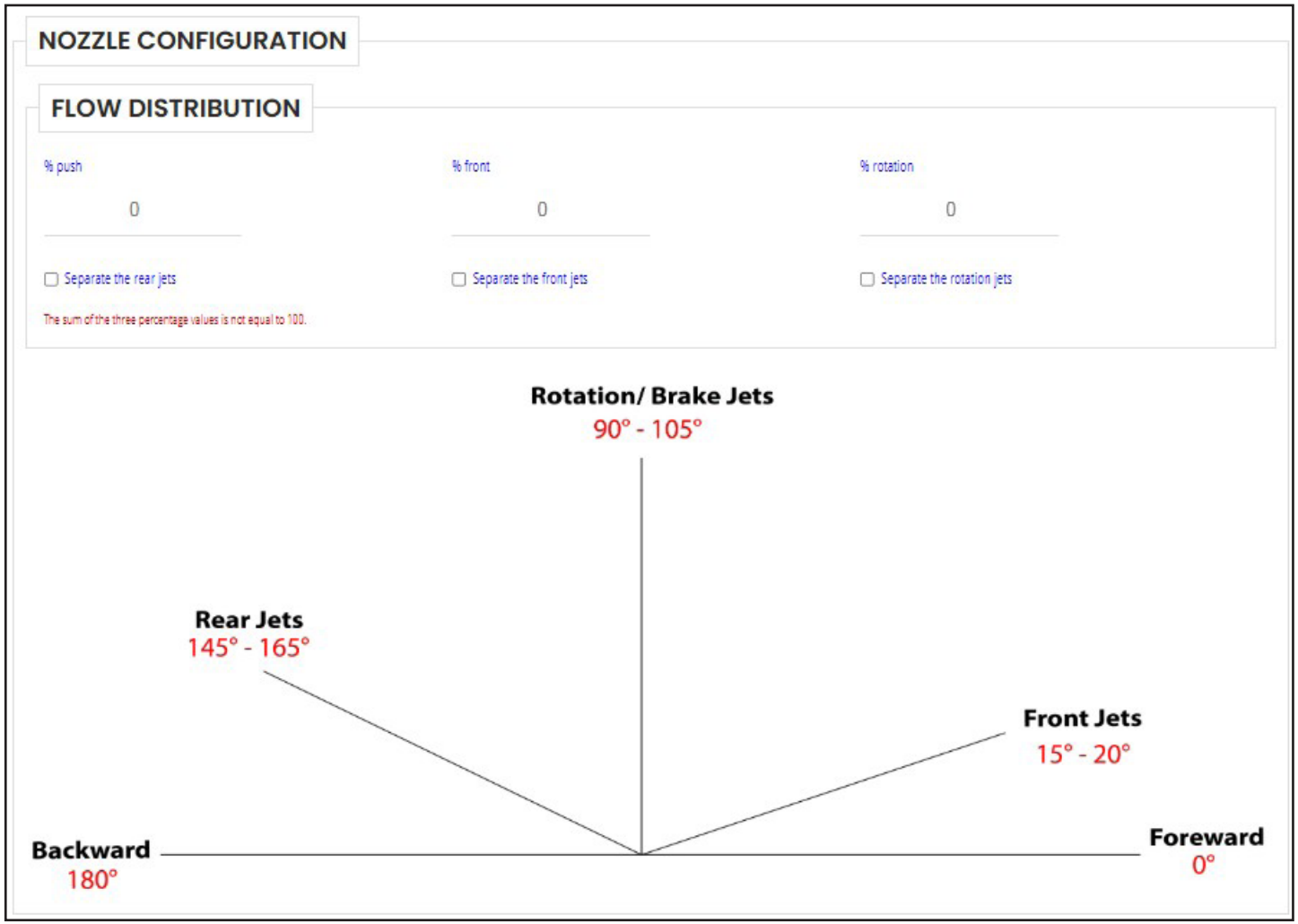


Section 2: Calculation of the pressure loss



The value showed in red indicates that the field is required.
Ticking the checkbox “Calculate the pressure loss” it is possible to enter the required data for the calculation of the pressure loss along the flexible hose.
If the checkbox is not ticked the pressure loss along the hose is considered to be null.
Another checkbox allows to perform the calculations with a flow value corresponding to 95% of the nominal flow of the pump.

Section 3: Nozzle configuration



The flow is splitted between rear, front and rotation jets: in order to go on with the calculation the sum must be equal to 100.
For the coefficients corresponding to the NCT nozzles please refer to the table at the end of this document.
The checkboxes allow to furtherly split the jets in two set in order to optimize the calibration of the jets.
The diagram shows the typical inclination for the jets.

Section 4: Sizing of the rear jets

The two thrust jet groups are configured. The specification of the jet inclination affects the calculation of the overall thrust (see convention for inclination angles in Section 10). The actual diameters are chosen from among those closest to the calculated diameter, so as to obtain an actual percentage between 90% and 100% of the target flow rate.
You can only proceed if the green alert is displayed:
The thrust flow rate is between 90% and 100% of the target flow rate
If the actual percentage is less than 90%, the black alert appears:
The thrust flow rate is less than 90% of the target flow rate
If the actual percentage is greater than 100%, a red alert will appear:
The rotation flow rate is greater than 100% of the target flow rate

Section 5: Sizing of the front jets

The same as for the rear jets.

Section 6: Sizing of the rotation jets

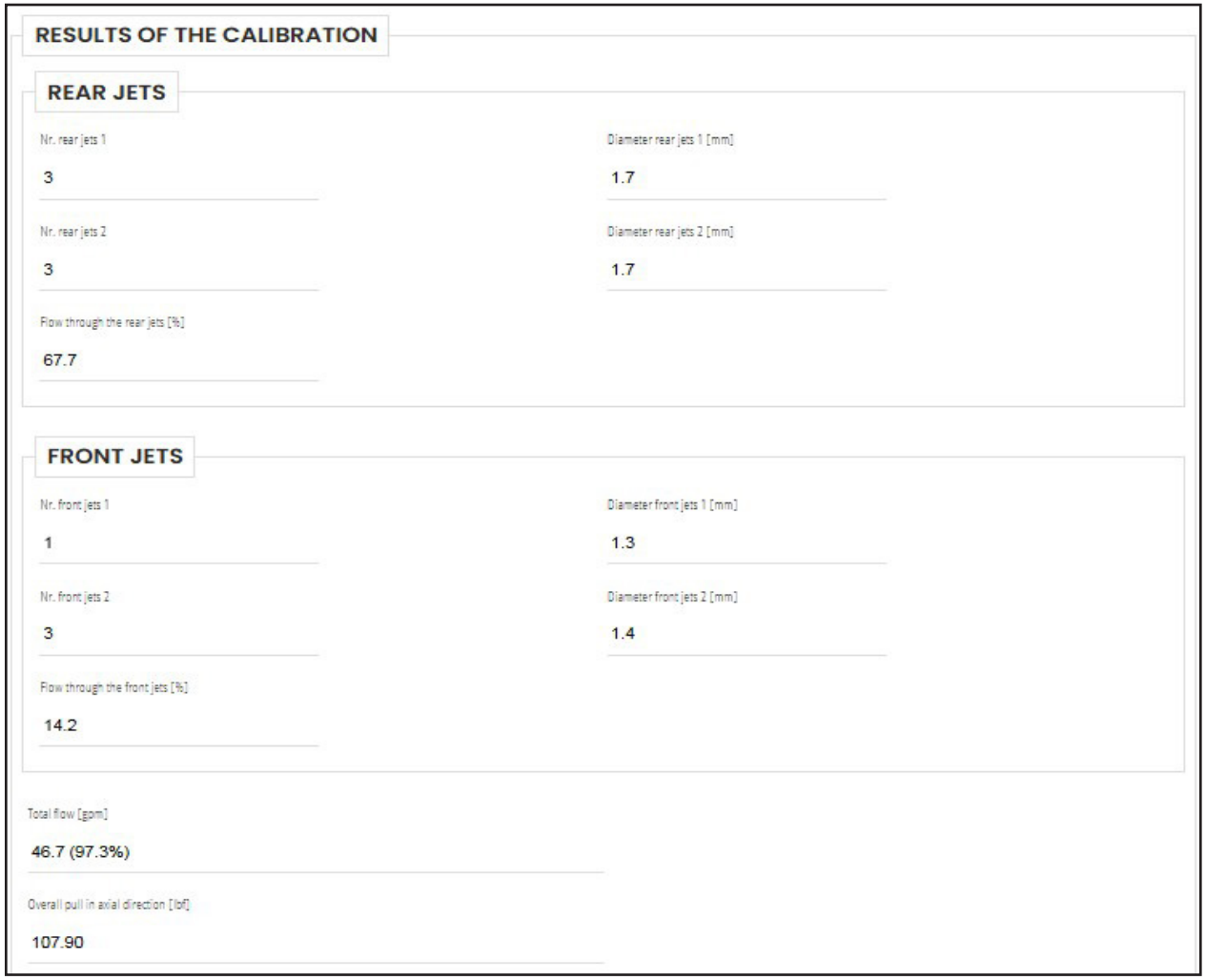
Getti di rotazione

Nr. Inserti rotazione: #2	Inclinazione Getti Rotazione: 90	Diametro effettivo dei getti di rotazione: 1.80 mm
Nr. Inserti Freno: #2	Inclinazione Getti Freno: 105	Diametro effettivo dei getti di freno: 1.60 mm
Diametro Calcolato dei Getti di Rotazione: 1.728 mm	Portata effettiva getti di rotazione [lit/min]: 63.1	Percentuale effettiva: 48.54
Differenza tra getti di rotazione e freno [mm]: 0.2		

La portata di rotazione è compresa tra il 90% e il 100% della portata obiettivo

Same as for thrust jets, except for the difference in size between the rotation and brake jets, which varies depending on the nozzle family.
In this case, the brake jets are the smaller ones. The difference between the rotation and brake jets must be greater than or equal to 0,2 mm.

Section 7: Riepilogo della procedura


RESULTS OF THE CALIBRATION

REAR JETS

Nr. rear jets 1: 3
Diameter rear jets 1 [mm]: 1.7
Nr. rear jets 2: 3
Diameter rear jets 2 [mm]: 1.7
Flow through the rear jets [%]: 67.7

FRONT JETS

Nr. front jets 1: 1
Diameter front jets 1 [mm]: 1.3
Nr. front jets 2: 3
Diameter front jets 2 [mm]: 1.4
Flow through the front jets [%]: 14.2

Total flow [gpm]: 46.7 (97.3%)
Overall pull in axial direction [lbf]: 107.90

In this case, a summary of the calibration of a nozzle with thrust and forward jets is shown.

Section 8: Parameters for nozzles configuration

The primary goal of calibration is to fall within the permissible range for the percentages of rotation or breakthrough jets. Next, the thrust jets must be sized to satisfy the flow rate checks for all insert groups inserted in the nozzle configuration (green alerts).

NOZZLES	TARGET FLOW (%)
Vibrating N.	25-40 (Rotation)
Raut	20-28 (Front)
Tremol	45-55 (Rotation); 0,2 mm difference (brake/rotation)
Avian	35-45 (Rotation)
Friuli	40-50 (Rotation)
Carnia	40-50 (Rotation)
Maniago	40-50 (Rotation)
Bora	15-30 (Front)
Bora 1/2”	15-25 (Front)
Turbina 1”	35-45 (Rotation)
Cyclone Avian	50-60 (Rotation)
Gris 1/2”	22-35 (Rotation); 0,8 difference (brake/rotation)
Malnis	22-35 (Rotazione); 0,2 difference (brake/rotation)
Ravedis 1/2”	28-37 (Rotazione); 0,2 difference (brake/rotation)

Section 9: Generate Report and Reset

GENERATE PDF — Generates a PDF with the summary of the calibration

RESET — Restore the input data of the calibration procedure

Section 10: Convention for the inclination of jets

Check out section 3.

It is assumed that the inclination of the jets varies between:
- 0°: this value corresponds to a frontal jet with no inclination;
- 180°: this corresponds to a hypothetical thrust jet with no inclination (same direction and opposite to the jet above).

Frontal jets with inclination (e.g., those of Raut) may have an inclination between 15° and 20°.
Rotational jets may have an inclination of around 90°.
Thrust jets typically have an inclination between 155° and 165°.